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Vol. IV

TRANSCRIPT OF RECORD

Supreme Court of the United States

OCTOBER TERM, 1942

No. 246

CHARLES CORYELL, ET AL., PETITIONERS,

vs.

JOHN S. PHIPPS AND GEORGE J. PILKINGTON

ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE FIFTH CIRCUIT

PETITION FOR CERTIORARI FILED JULY 20, 1942.

CERTIORARI GRANTED OCTOBER 12, 1942.

VOLUME IV.

TRANSCRIPT OF RECORD

UNITED STATES

CIRCUIT COURT OF APPEALS

FIFTH CIRCUIT.

No. 10185

CHARLES CORYELL, ET AL.,

Appellants,

versus

JOHN S. PHIPPS and GEORGE J. PILKINGTON,

Appellees.

Appeal from the District Court of the United States for the Southern District of Florida.

(ORIGINAL RECORD RECEIVED DEC. 17/41.)

Mr. Botts:

If the Court please, I suggest that the facts elicited by this witness clearly do not show him to be a hostile witness.

The Court:

I will hear from both of you on that when the time comes.

(By Mr. Underwood):

Q. Mr. Bernard, what portion of your work is on behalf of marine underwriters? I mean by that, Mr. Bernard, what is the proportion between the amount of work you do for underwriters on the one hand and for owners on the other?

A. I judge 75% for underwriters and 25% for classification and owners.

Q. Can you break that 25% down and tell me how much of that is for owners and how much of that is for classification societies?

A. Probably 10% for owners and 15% for classification.

Q. What proportion of your livelihood comes from the fees you get from the work you have told us about?

A. About 80%.

Q. Now you have referred to or admitted a conversation with Mr. Hawkins following the fire on the Seminole, is that right?

A. Yes, sir.

Q. What did you know at that time as to the insurance on the boats that had been burned?

A. Is that as to amount, sir?

Q. I will rephrase my question so there can be no misunderstanding: did you or did you not know that some of those boats were insured by marine underwriters?

A. I knew that there were some.

Q. Did you have any information as to how many?
A. No, not at that time.
Q. Do you know?

Mr. Botts:
I object to that. It is immaterial what he knows now.

A. Not the exact number of boats, no.

Mr. Botts:
I move to strike the answer.

The Court:
Captain Bernard, you answered that before the Court ruled on the objection. I will ask you not to do that. I will overrule the objection and deny the motion to strike.

Q. What was your reason for refusing to accept employment by Mr. Hawkins when he spoke to you after the fire on the Seminole?

Mr. Botts:
I object to that as being immaterial.

The Court:
Overruled.

A. I was representative of the Board of Underwriters at that time and also agent for United States Salvage and other independent interests.
Q. Will you tell me whether or not you realized that there was a conflict of interest between the underwriters you represented and the parties Mr. Hawkins represented?
A. I think that was too early after the fire to sense anything like that.

Q. Isn't it a fact, Captain, that your appreciation of that conflict is the reason for your refusing employment when Mr. Hawkins sought to engage you?

A. Yes.

Q. Now you had surveyed the Seminole prior to 1935; had you not?

A. Yes.

Q. Do you remember when it was that you were aboard the Seminole in 1935?

A. March 27th and 28th.

Q. You were on board her two days?

A. Yes, and there may have been a third day but I don't want to make that point; but I was there two days I know.

Q. You inspected her when she was afloat as well as when she was dry, did you not?

A. Yes.

Q. And the purpose of your inspection was to ascertain her condition generally, was it not?

Mr. Matteson:

I object to that as leading, your Honor.

The Court:

I will sustain the objection.

Q. What was the purpose of your visit and survey of the Seminole?

A. To make an examination of the hull on drydock; she was on drydock when I first made an examination of her *hull* conditions and with the thought of sending the vessel out to make a short cruise as to her fitness.

Q. Her fitness in what respect?

A. Well, that just means that?

Q. In what respect were you interested in her fitness?

A. General condition as to the hull was more my interest.

Q. Are you telling me, Captain, that your only interest was in the tightness of the hull?

A. Well, that would refer to the general condition; I will say the "general condition" but primarily this first visit was to make an examination of the hull on dry-dock, outside and inside.

Q. How many visits did you make?

A. Two.

Q. What was the purpose of the next visit?

A. I made a verbal report and they asked for an outline to make application for insurance, and I went back and took another observation and examination.

Q. What was the purpose of the second examination?

A. It was to apply for insurance for a short trip around the Keys, I believe, and into the Gulf—

Q. Do you remember what work you thought it was necessary to do before you could pass her?

A. Outside of fire extinguishers I haven't memory of anything that I asked for; I asked for reconditioning of fire extinguishers; other than that I haven't any memory of making any recommendations.

Q. There has been some testimony in this case, Mr. Bernard, about some repairs—putting a cement patch around the stern. Do you remember anything about that?

A. Never heard of it.

Q. Do you deny that you recommended that?

A. No, sir.

Q. Do you deny that you recommended that?

A. ~~When you~~ say "stern" will you name the place. Do you mean the sternmost compartment? No, I didn't have anything to do with that, and I made no such recommendation.

Q. Did you make any recommendation about patching any plate?

A. No, sir; I made no recommendation about patching any plating.

Q. What your testimony be that the only thing that you recommended be done was to refill the fire extinguishers?

A. Yes, sir.

Q. Did you confine your examination to the outside of the boat?

A. I made a close internal examination of the hull and the parts.

Q. Did you go through the bilges?

A. I did.

Q. What condition did you find the bilges in?

A. I found them clean and free from gas and any element that might indicate there was any weakness or gases that might be detrimental in the use of the boat.

Q. Do you know whether there were backfire deflectors or arrestors on the carburetors on the main engines?

A. I can't certify that; I can't memorize that; I believe there were, though I am not sure.

Q. I show you a paper which has been marked Respondents' Exhibit DD, and call your attention to the first paragraph on the top of the second page. Does that refresh your recollection as to the—

Q. What is the fact; were there backfire deflectors there?

A. There were.

Q. You may keep that before you, if you like.

A. All right.

Q. Do you remember where the air tanks used for starting the motors were located?

A. I don't at this time.

Q. Will you look at the first paragraph on the second page of that exhibit and see if that refreshes your recollection?

A. Yes; it has outlined here the location of them.

Q. Is it a fact that they were located as I have suggested?

A. Yes, sir.

Q. Did you observe what sort of a generator she had?
A. Yes; she had two generators.
Q. What were they?
A. One was a six cylinder Winton and the other was a small engine, a four-cylinder Universal, I believe.
Q. Where were they located?
A. On the port side of the engineroom.
Q. In what kind of a space?
A. In an open space.
Q. Roomy space?
A. Yes; on shelving above the engineroom floor.
Q. That is the Universal you are talking about?
A. I believe they were both on the one side; if my memory serves me right they were both on the one side.
Q. Are you suggesting that the six-cylinder Winton engine was on a shelf?
A. On a base.
Q. Base and not a shelf?
A. Base.
Q. Did you observe how the carburetors received their supply of gasoline?
A. Yes.
Q. Did you observe what sort of bilge pumps she had?
A. She had motor-driven bilge pump—I am not certain whether there was one attached to the engine or not, but she had one independent motor-driven pump, rotary.
Q. Did you observe anything about her water pumps?
A. She had some general service pumps; there was a fresh water pump but I am not sure about the salt water pump, but I believe there were two units there.
Q. In what condition did you find these things we have discussed so far?
A. From my observation of the engineroom on that boat that day, without any engineer there, I judged them to be in order.

Q. Isn't it a fact that you reported that they were found in good operating condition?

A. That might have been my wording.

Q. Isn't that your wording?

A. Yes.

Q. Did you observe her electric batteries?

A. I did.

Q. What kind did she have?

A. I am not sure but I will say Edison

Q. Do you remember how many trays?

A. No, I don't, sir, but I believe that is in the report.

Q. Can you refresh your recollection by referring to the middle of page 2?

A. 20 trays of 5 cells each.

Q. That would be 100 cells?

A. Yes, sir.

Q. Did you examine them to determine their condition?

A. They were apparently in good condition.

Q. Did you examine her gasoline spaces and gasoline tanks?

A. I don't believe you can get into the gasoline space to make much of an observation.

Q. Did you attempt to do it?

A. I did on the "entire side" because I tried to get in there and have a look.

Q. Were you looking at the tanks as far as you could?

A. I looked for any leaks that might exist in them.

Q. Did you find any?

A. No, sir.

Q. Do you remember how many tanks she had?

A. Yes.

Q. How many?

A. Four.

Q. What shape?

A. Cylindrical tanks, standing on ends.

Q. They were located in a separate space forward of the engineroom space; is that right?

A. Yes.

Q. What was the nature of their construction?

A. Cylindrical tanks with riveted seams, steel.

Q. Were they all heavily constructed?

A. They were for that service.

Q. Were they well bedded?

A. I couldn't certify to that, because I couldn't get to "it".

Q. Were they well bedded and screwed to place?

A. From what I could observe they were and I believe I wrote them up that way.

Q. In fact, you reported to that effect, did you not?

A. Yes, sir.

Q. Did you observe how those tanks were filled?

A. Yes.

Q. How were they filled?

A. They were filled from the top by a two-inch filler line.

Q. Did you ascertain whether these filling lines were tight?

A. I presumed them to be tight from their connections; they were all solid connections.

Q. Did you report that the banks filled through tight deck fittings?

A. I did.

Q. Did you observe that they were vented overboard?

A. I did.

Q. Did you observe what shut-off valves there were in the feed lines from the tanks to the carburetors?

A. I did.

Q. She was equipped with shut-off valves?

A. Yes, sir.

Q. In what condition did you find the tanks and the piping to be?

A. There were no leaks.

Q. Isn't it a fact that you reported the tanks and piping vented pipe and in order?

A. Yes, sir.

Q. Did you observe whether or not there was a glass gauge fitted to show tank readings?

A. Yes.

Q. Was there one?

A. Yes.

Q. You saw that?

A. Yes.

Q. Did you see the auxiliary gasoline tank for the windlass engine?

A. Yes, sir.

Q. Do you remember the shape of that?

A. I don't remember the shape of it but I think it was a cylindrical tank.

Q. Do you know where it was located?

A. Forward, adjacent to the engine machinery, by a window.

Q. What was it made of?

A. I can't remember.

Q. You may look at your report and refresh your recollection—the fourth paragraph from the bottom of the second page.

A. It is galvanized iron, capacity about 10 gallons.

Q. Did you examine that tank and fittings?

A. Yes.

Q. In what condition did you find them?

A. I found them tight.

Q. In order?

A. Yes.

Q. Did you examine the main switchboard of the Seminole?

A. Yes, sir.

Q. The wiring and light fixtures?

A. I noted the electrical wiring and part of the lights.

Q. Did you find them in good order?

A. Yes, they were in order.

Q. You knew they were knife switches of the open type?

A. Yes.

Q. And the switchboard was in the engineroom?

A. Yes.

Q. Did you report that all of the United States government requirements had been fully complied with?

A. Yes, sir.

Q. Did you report that from your examinations the general condition of hull, auxiliary machinery, deck and deckhouse equipment was found to be good, considering the age of the vessel?

A. I did.

Q. And you passed the vessel?

A. That report I believe was accepted by the Underwriters, and I understood she had some coverage on her for a short trip. What I certified by that remark there is nothing but an opinion, and I don't know whether it is worth anything or not.

Q. You knew that your report was going to be considered in the fixing of insurance on that vessel, did you not?

A. Yes, sir.

Q. And you had been making such reports for many years?

A. Yes.

Q. You were engaged in the same business before you came to Miami?

A. Yes, I was, and for the best firm in the United States.

Q. What firm is that?

A. Franklin A. Martin, 25 Broadway.

Q. How long have you engaged in this business altogether?

A. From the beginning of my career?

Q. Yes; from the beginning.

A. From the time I was 14 years old I have been connected with mechanical work and marine work, and I have held a Chief Engineer's license since 1900.

Q. How long have you been a surveyor?

A. Surveyor?

Q. Yes.

A. Directly surveying and general surveying—directly active 22 years.

Q. You had been familiar during all of that time with the rules National Fire Prevention Association, have you not?

A. Yes; I might be caught on some details of them, but I know their outline and their various formulaes and use them and am guided by them.

Q. I suppose you know now and knew in 1935 of the rules of the Bureau for the Prevention of Explosion and Fire on Motor Vessels?

A. Yes, sir.

Q. And you know about Lloyd's rules?

A. I would have to check up on some of them; it is too hard to remember them all.

Q. I didn't mean to suggest that you had memorized them. You are generally familiar with them?

A. Yes, sir.

Q. And you know the rules of those three organizations?

A. Yes.

Q. You examined the Seminole in 1935, in March?

A. Yes.

Q. For insurance purposes, and you passed her?

A. Yes, sir.

Cross Examination.

By Mr. Matteson:

Q. Mr. Bernard, you have been referred to as Lloyd's agent.

A. Yes, sir.

Q. Or sub-agent?

A. Umh, hmh.

Q. Will you tell us exactly what that amounts to?

A. Well, it is a person placed in a locality to attend to an emergency in the event of a vessel covered by Lloyd's, being in trouble, or any other vessel; or to serve a Master or an owner, in aiding or directing them in the time of marine trouble; also to report marine trouble and to keep in touch with the London office with regards to what might be going on; it might be a disaster; it might be some vessel that has come in here. I have had three vessels lately, one went to $32,000.00; one went up last week to $19,000.00. They like to know where that vessel is going, how it occurred, and when it occurred. That is given to them by cable through my office in this district.

Q. Do you receive any salary?

A. No, sir, there is no compensation.

Q. From time to time, when such disasters occur, you are employed by them in that connection?

A. I get a fee of some sort; it may be the underwriters will pay that fee, or it may be that they arrange with the owner to pay it, and they in turn collect from the underwriters.

Q. This Lloyd's organization that you speak of has representatives like you in many ports, does it?

A. Yes, sir, all ports are supposed to be covered by some agency or sub-agency.

Q. And you receive your compensation only when you are employed in connection with some particular disaster?

A. Yes, sir, or a loss. Suppose there is a foreign boat comes in with a loss, coming over, due to heavy weather, and I am engaged to take care of that loss and present it to the underwriters, I get a fee from that. That is how I get my compensation.

Q. But your compensation is in individual fees, in individual cases?

A. Yes, sir. Individual fees in individual cases.

Q. And this service that you perform in reporting accidents or losses or disasters, is part of the service that you render, so that you will receive employment in connection with those cases, is that true?

A. Well, I will get a fee for services for any small job that I might wish to submit, but I don't do it; that is in line; I can enter a fee but I don't do it, unless it is a major case.

Q. Does the position of Lloyd's sub-agent require any technical experience, or is it sometimes performed by people without such experience?

A. I think that is developed from knowing the character of the person that might be taking the position.

Q. The term, Lloyd's sub-agent, does not necessarily mean that a person is a surveyor, then?

A. No, sir.

Q. You speak of being the representative of the Board of Underwriters of New York,—or rather, correspondent. Is your relationship with that organization somewhat similar to what you have described with respect to Lloyd's?

A. Yes, sir.

Q. What is the American Bureau of Shipping?

A. Classification of American Vessels.

Q. Is that the official classification society in this country?

A. It is.

Q. And you are one of their list of surveyors?

A. Yes, sir.

Q. What is the U. S. Salvage Association?

A. That is a Board of Survey, representing I would say, a number of underwriters,—I don't know how many.

Q. It is an incorporated organization is it not?

A. I cannot say so; I don't know that technicality.

Q. It is an organization?

A. Yes, sir.

Q. And is employed by underwriters from time to time in connection with disasters?

A. I think it is established and maintained by underwriters; I don't believe it is employed. I think that is maintained, as I understand it.

Q. Renders services to underwriters and receives compensation for this service?

A. Yes.

Q. Is there a difference between Lloyd's as an insurance organization, and Lloyd's as a classification society?

A. I couldn't tell. I believe that would be governed by the policies issued by either one.

Q. Well, don't you know as a matter of fact that Lloyd's classification society is an independent organization similar to the American Bureau of shipping in this country?

A. Yes, sir.

Q. That is correct, is it not?

A. Yes, sir; I beg your pardon sir, you were referring to insurance, were you not—American insurance, when you first asked that question?

Q. I don't know; if there is anything that is not clear to you, we will try to straighten it out; but I don't understand what isn't clear. Is there some explanation you want to give?

A. I think I have made a long answer. I interpret you to say, or to try to ask me, the value, in words, the value of Lloyd's insurance as compared to an American company's insurance.

Q. Oh, no, we are not suggesting anything of that kind. You were employed by Mr. Hawkins to make this examination of the Seminole?

A. I believe the message came from his office. Yes, sir, Mr. Hawkins' office. I didn't get it direct, I was out at the time, and I got it when I arrived. But it came from Mr. Hawkins' office; listed that way in my office.

Q. What were your instructions with respect to this examination?

A. To make an inspection of the Seminole. She was on dry-dock and they wanted to have an inspection made.

Q. For what purpose?

A. At that particular time, it was to report on the general condition of hull, if she was all right and ready to be on dock, if there was any more work to be done on dock.

Q. So the first instruction you had was solely with respect to an examination of the hull?

A. Yes, sir.

Q. And you made that on the 26th of March, 1935, is that correct?

A. Yes, sir.

Q. And—

A. Yes.

Q. And that had nothing to do with any insurance?

A. No, sir.

Q. And did you understand at that time that you were acting for the owner of the vessel, or someone else?

A. It was an owner's call, sir.

Q. Now do I understand that you received some further instructions after you had completed that examination?

A. Yes, sir.

Q. From whom did you get the instructions that time?

A. Mr. Hawkins.

Q. Did you talk with him personally?

A. Yes, sir.

Q. And what instruction did you get with respect to that survey,—with respect to that examination?

A. He informed me that he wished to have the vessel covered to make a short trip down to the Keys, and he would like to have a report on her condition.

Q. Well, is that in substance what he said to you?

A. Yes, sir, about that, as near as I can remember.

Q. In making this examination that you made, after the first one, what did you have in mind?

A. Well, the vessel was afloat, and I wanted to see the interior of the hull, afloat. She was dry when I saw her. I wanted to see what the hull was like inside the boat. She has quite a pretty big bilge, you know, a good big bilge space; I wanted to get in there, there was a good chance; I said to myself "I am going in again and have a look around". Lots of times when vessels go on a dock why they usually check it up; they certify her when she comes off.

Q. So that is all that you had in mind when you went on board the second time?

A. Yes, I wanted to check up the machinery a little, and go around the decks and the fire extinguishers, I wanted to check them up.

Q. Did you understand at that time that you were expected to make a thorough examination of all the machinery and appurtenances?

A. I couldn't make a thorough, examination on that type vessel, sir. I would have to open up machinery and open up spaces, and I could make a general examination, which would represent what I was doing; but I wouldn't make a thorough examination, no; it wouldn't be represented that way.

Q. Now you went on board the Seminole for that purpose, did you?

A. I don't know what I am answering now, sir.

Q. Well, perhaps that is not very clear. Anyway, you went on board the Seminole the second time?

A. Yes, sir.

Q. And did you go into the engineroom on that occasion?

A. I entered the engineroom, yes, sir, for a short interval.

Q. Were you alone in the engineroom, or was there anyone with you?

A. I was,—I was alone.

Q. Was there any engineer on board the vessel?

A. No, sir.

Q. Was there any Captain on board the vessel?

A. No, sir.

Q. Was there anybody on board the vessel?

A. Yes, sir, there was a young man that I saw working, doing odd jobs on the vessel; the same man was there each time that I appeared there.

Q. Was he the only one that was there?

A. Well, I couldn't vouch for that, I didn't ask him; there may have been others that I didn't happen to see.

Q. He is the only one that you saw?

A. He is the only one that I saw.

Q. Mr. Bernard, did you observe when you were in the engineroom, a drain valve connected with the gasoline piping system from which gasoline could be drawn in the engineroom?

A. I did not.

Q. If you had observed such an arrangement in the engineroom, would you have passed the vessel?

Mr. Underwood:

Wait a minute, I object to that, your Honor; it is speculative.

(Arguments by counsel.)

Mr. Botts:

If the Court please, I would like to make this observation; that if proving an examination for the purpose of some insurance, isn't calling for an expert opinion and expert examination, I don't know what its purpose was; and I think clearly he has presented that phase of it and purported to rely on it.

The Court:

No, I don't think so. I think the witness has not been introduced as an expert. He has been introduced,—he may be an expert, but he has been introduced to testify as to his employment, and what he did, and the report he made. This question I think calls for an expert opinion to be made at this time, so unless the Libelants care to make him their witness, why I shall sustain the objection.

(Argument by counsel.)

Mr. Matteson:

As I understand the question is objected to and the objection is sustained, is that the position?

The Court:

Yes, sir.

Q. How do you account for the fact that you did not observe that draw-off line in the engineroom, Mr. Bernard?

A. It is out of the ordinary lead from the main line; it went along from the port side—

Q. Well—

Mr. Underwood:

Let him finish, please; how did it go?

A. It is off the ordinary lead from such a line; it was a long lead, from the main line, run along the starboard side of the vessel, from the manifold of all four tanks. It was made into this main line. And this, as I saw it after the fire, led close athwartship over to the port side of the vessel, and probably led underneath some conditions such as batteries or something else, and was not observed. We looked for draw-off lines or draw-off connections in close proximity to the main line. The main line and the feed line to motors. Another point was that that would probably be in the shadow; the ship was dead, and they hadn't anything in the way of lights in that engineroom, and I didn't go searching for something out of the ordinary, in the draw-off line.

Q. How long were you in the engineroom, Mr. Bernard?

A. Well, at that time I was in there probably about twenty minutes. But I had been previously in there, with regards to the motors, particularly the motors and the general lineup of a little generator and the bilge pumps; the bilge pump connections mostly; went in there to get all leads to see if they led to the different places.

Q. You were in the engineroom twice?

A. Yes, sir.

Q. And the first time you were interested only in bilge pumps, is that right?

A. No, I said, a combination,—the general condition of the engines and pipe lines, but not going into any detail. Primarily it was to see about the bilge pump and bilge pump conditions; that was when I was considering the hull.

Q. That was the bilge pump and the bilge pump connections and whatever machinery was connected with the bilge pumps, is that it?

A. Yes, sir; the motor to drive the bilge pumps; they wouldn't be any good if the motor wasn't fit to move them,—the generator.

Q. Let's see if I understand you correctly. The first time you went into the engineroom, you were—the only thing you examined was the bilge pumps and the bilge connections,—and the engines connected with the bilge pumps?

A. And the switchboard and connections that drove that motor, and the general conditions; and that involved a lot in that engineroom, to move that bilge pump; they have a lot of moving parts and connections.

Q. Did you move the bilge pump?

A. Oh no, I wouldn't start anything on a dead ship, not me.

Q. Why not?

A. Why it isn't my place, not my property. I would ask for or order it done, and go back and find out how it was operating after the official operator was on it.

Q. Was there anyone there that you could order to operate the machinery?

A. Not that I know of, that had—I wouldn't want to ask, only from the firm themselves,—to send their man there and start the motor.

Q. And did they send any man over to operate it?

A. I didn't ask for that and didn't require it. I convinced myself it was all right.

Q. And you are referring now to the pump?

A. I am referring to the pump and the parts that were required to operate the pump, which are many. It has to go through the switchboard, the generator has to be started, and there is a manifold of valves has to be operated; sea-suction to be opened up.

Q. Now tell us just exactly what you did to ascertain the operating condition of the bilge pump?

A. I went down to have a look at the motor, the generator. The generator apparently was in good condition. There was nothing wrong I could tell, from the ordinary standpoint of many, many vessels I have examined standing still. There is one way of examining it, but from what I could ascertain, that the generator, switchboard, and the connections, and the batteries necessary to maintain those, together with the pump itself, and its connections, were in order. I tried the valves and manifold.

Q. Did you try anything else?

A. No, just tried the valves and manifold; tried the valves and the bilge manifold.

Q. You tried the valves?

A. Yes, sir.

Q. And is that all that you tried?

A. That's all.

Q. What else did you try?

A. I didn't try anything else.

Q. Did you operate the generator?

A. No, sir.

Q. Did you operate any of the machinery?

A. No, sir; never have on any vessel that I ever approached as a surveyor or an owner's representative, or as a superintending engineer.

Q. I understand you to say that if there is an engineer present, you order them to do that?

A. If he offered to do so; if I said to him, "I am going to ask to have these turned over", if he said he would turn them over, they do it all right. I didn't ask him to do that.

Q. There was no one there at this time that you could ask to do that?

A. No, sir. I believe that was pretty early in the morning I went over there, very early that morning, I remember.

Q. Well, you can't really determine the operating condition of a piece of machinery without operating it, can you?

A. Well, I think so.

Q. Merely by observation?

A. I think the underwriters understand that. We don't try out every part.

Mr. Matteson:

I move to strike that out as not responsive.

The Court:

* * * I grant the motion.

Q. Just confine yourself to answering my questions, please.

A. Yes, sir.

Q. Did you operate any of the switches on the switchboard?

A. No, sir.

Q. Did you make any test of the gasoline tanks?

A. What kind of test, please? Hydraulic?

Q. I want to know what you did.

A. I made a search for odor or leak of gasoline; for the odor or leak of gasoline from the gas tanks.

Q. And that is all you did?

A. Yes.

Q. Did you put your head in under the gasoline compartment?

A. Well, I don't say I put my head in, or what I did; I can't remember what I did.

Q. Did you go into that compartment?

A. I couldn't go in there.

Q. Why not?

A. It was between bulkheads; between bulkheads.

Q. Could you see part of the tanks?

A. Might get a slight observation of the side of one or two; nothing—

Q. You couldn't make any general examination?

A. No, you could not; no.

Q. Was there any gasoline in the tanks at the time, do you know?

A. I didn't observe that, sir.

Q. Then do I understand that your observations in the engineroom were confined merely to visual observations?

A. Yes, sir.

Q. Where was the boat when this examination was made?

A. Coconut Grove; down at Coconut Grove, Florida.

Q. And where was she lying there, afloat?

A. She laid the first time on the marine ways there.

Q. And the second time?

A. At a pier adjacent there, one of the piers, I can't remember which one.

Q. A pier that projects out in the bay?

A. I couldn't say that, I don't remember that. As near as I remember, the second time she was in that yard.

Q. Did you have any light in the engineroom when you were there?

A. No, sir.

Q. The current was all off the switchboard, was it?

A. I couldn't say, sir, I don't know.

Q. You don't know whether any of the switches were connected on the switchboard at that time?

A. The switches may have been in there, but the current must have been cut out at the batteries. I didn't move the battery switch. There is a cutout on that battery.

Q. You can't tell us whether any of the switches on the switchboard were connected at that time?

A. There was no juice on the main switchboard, I know that. There may have been switches in on the board, but no juice from any main, through the board.

Q. How do you know there was no juice on the switchboard?

A. I didn't see any lights burning anywhere.

Q. Is that what you judged by?

A. Yes.

Q. Did you examine the switches on the switchboard?

A. Not closely. It was a good looking switchboard, that's all I memorized.

Q. That's all you noticed; it was a good looking switchboard?

A. Yes, and has an elevation from the floor, and that was essential.

Q. What was the condition of the windows in the engineroom when you were in there the second time, afloat?

A. The condition of them?

Q. Yes, were they open or closed?

A. I don't remember.

Q. Do you remember the location of those windows?

A. Yes, sir, I do.

Q. What windows were there?

A. There was a window through the top side on the port side, through the side of the hull, top side of the hull on the port side; that is a rectangular window. There was a similar window in a fore and aft bulkhead in the alleyway on the starboard side.

Q. Was that a steel bulkhead between the engineroom and the alleyway?

A. Yes, sir.

Q. What means of ventilation did you notice in the engineroom, besides the windows?

A. From a raised trunk they had two fourteen inch ventilators. They also had a ventilation through a hatch that entered the engineroom. That's about all that I can remember, I believe. There may have been another coam-

ing or a hatchway, I am not sure, but I believe there was, three sources from that raised trunk over the engine-room.

Q. That is these cowls—

A. There might have been windows in through the raised trunk, I can't remember; but there was a raised trunk over the engineroom on the boat deck.

Q. And extending upwards from that raised trunk, were these two cowl ventilators?

A. Yes, two cowl ventilators.

Q. And this hatch, was that in the raised trunk?

A. It extended above the raised trunk, it was what we call a coaming, a raised coaming.

Q. Is that all that you saw in the way of ventilation at that time?

A. All that I can remember.

Q. Did you observe any sort of ventilating device that led into the bilges?

A. There was none.

Q. Are you sure of that?

A. Not that I observed.

Q. Did you look for them?

A. I don't believe I did; I don't think I did.

Q. These ventilators that extended up from the deck, did you observe those on deck?

A. I can't remember that, whether I went up there to look at those cowls or not.

Q. How did you get into the engineroom?

A. I went down through a hatch from the upper deck.

Q. And that's this hatch that you have just spoken of in the trunk over the engineroom?

A. Yes, sir.

Q. What do you mean by trunk?

A. It is a raised structure over the level of the ordinary decks; steel structure; it happens to be a coaming,—raised coaming.

Q. Then as I understand it, over the engineroom there was part of the deck that was raised up a little higher than the rest of the deck?

A. Yes, here is the deck; I believe this is the boat deck; I am not certifying this correct. Over the engineroom was a raised trunk on which was these ventilators. In other words, the distance from the engineroom up to the deck would be one distance, and then you come up probably eighteen inches, when you get into the space, which gives more air from the engineroom; in other words, it helps to ventilate that engineroom space.

Q. What is it helps to ventilate the engineroom space?

A. This compartment, this rise, that extends the height of the engineroom.

Q. It extends the height of the engineroom?

A. Yes.

Q. In that particular spot, is that it?

A. Yes. Well, that is fitted over many cabins and many places; that is its purpose.

Q. How high did you say this trunk was?

A. I believe it was, as near as I can memorize or visualize, somewhere about fourteen to eighteen inches.

Q. And the hatchway and the cowl ventilators were on top of this trunk, is that it?

A. The hatchway was; now I am not certain about the cowls, the ventilators. I think it was a tube or a duct; but the duct that led into the engineroom come over the top of that raised deck.

Q. If the stenographer has it correctly, Captain, I don't understand it; would you read the question again to him.

(Preceding testimony was read.)

Q. Well now, you have a statement of a duct; what do you mean by that?

A. That is the extension, the tubing that goes from a ventilator, goes into small lines; that is after it leaves

the cowl section; an air duct or ventilator duct or ventilator tubing.

Q. Well, these cowl ventilators, as I understand it, came down to the top of the trunk?

A. Uhm, hmh.

Q. Have you any recollection of their coming any farther than that?

A. No, I have none.

Q. There has been some suggestions, Captain, of some two inch pipes with goosenecks at the top, fixed in the deck besides this trunk and extending down into the engineroom. Did you see anything like that—extended into the bilges?

A. I didn't notice them, sir; I didn't observe them.

Q. When you describe the means of ventilation in the engineroom, you did not mention any such thing, did you?

A. No, sir.

Q. And I understand you to say you did not observe any such thing?

A. No, sir.

(Informal recess was had.)

Mr. Matteson:

* * * I move to strike out the testimony of this witness on direct examination that he passed this vessel for insurance.

(Discussion and argument.)

Mr. Botts:

* * * I move to strike all the testimony whereby he was qualified by his experience as an expert. I refer to the testimony as to the length of time that he was acting as surveyor, for whom he has worked, and his

various qualifications. They asked him every question that would qualify him as an expert. * * *

Mr. Matteson:

If Mr. Underwood will agree in this case that he will not in this case for any purpose, at any time, rely upon the testimony of Mr. Bernard as an expert, or on his report as a qualified expert, the situation would be quite different. * * *

The Court:

I will have to adhere to my original ruling. The motion is denied. * * *

(By Mr. Matteson):

Q. Mr. Bernard, do you draw a distinction between an insurance survey and a condition survey?

A. I do, certainly do.

Q. What is the difference?

A. I am carrying out a condition of survey now here on a yacht going to the west coast. I call for that yacht to be dry docked, her bottom cleaned, her plates drilled for thickness; both tail shafts out, thrusts opened up. Mind you, this is two lines of shaft,—inboard and outboard shaft; going on now, right here in Miami. The fuel tanks emptied, all fuel taken out, and entered and cleaned. That has been done on this yacht. The work on the port engine, I inspect every cylinder head; taken to the yard, treated to remove sand and hard scale. Removed every piston, wrist pin, connecting rod, and its bearings; laid them out and examined them. I have stripped the engine casing of that port engine, and had men go in there and clean it, and have a man who is responsible to me, to see that it is clean, all crevices. When that is completed I am going over on the port engine; when that is completed I will go into the pressure tanks

and put hydraulic pressure on them and test them out, also take the thickness of those tanks. I will go to the switchboard; I am not an expert electrician, but I will have a report from an electrician, as to the terminals, and as to the strength of what might be contained in the safety fuses of those particular switches. I have been in her bilges, every part of her and crawled through them. I have opened up where I could on her skin, and examined her internally. I have searched her masts, and searched her deck where the masts come, searched the metal stepping, and all coamings and decks, and all pie-plates on her deck, and the deck itself. I have raised her anchor chains, gone down into her chain locker; removed the protection boards in the bilges,—had them removed, to get into the bliges, to see the condition of the metal and the condition of the protective coating in all those bilge spaces. That is what you call condition surveys.

Q. And is that the kind of a survey you made with respect to the Seminole?

A. It was an inspection for insurance purposes.

Q. And not a condition survey?

A. No; not as known as a condition survey.

Q. What do you charge for a condition survey?

A. A condition survey? I am doing that for Lloyd's, Lloyd's Classification of Vessels, and I have nothing to do with the charge. They are paying me a charge that I might submit, as to the number of visits required and the energy I may have to spend there. It is in the book there. Mr. Thompson—that book he holds, he has got it there. I would have it if I had the books, but the property happens not to be mine.

Q. Well, it would be a good deal more than $17.50, wouldn't it?

A. Sir?

Q. That work would amount to a good deal more than $17.50?

A. Would you allow me to answer about the $17.50? Would you like to know about that?

Q. Just answer the question.

A. It would be more, yes, sir; it would go into probably $235.00 and might involve the owner,—you see, that is the fee, and may involve the owner in spending $2,000.00 or more. This owner will probably spend $2500.00.

Q. And for what purpose would that amount be expended?

A. Opening up, dry-docking the vessel, opening up, meeting the requirements of painting bottom—cleaning and painting bottom, pulling out all shafts, doing what is required to do to the bearings, to maintain her condition as being a-1, what might be involved in renewing parts of engines that might be required, to bring her to a-1 as to condition.

Q. That's what you do to bring her to an a-1 condition?

A. Bring her up; she is classed, mind you; and the Seminole was not a classed vessel. There are only a few rules and regulations that might guide you as far as the Seminole was concerned, being in condition,—or any such type of vessel. They are classed by different requirements from the ordinary—

Q. Do you think the standards of safety with respect to class jobs are any different than the standards of safety with respect to other yachts?

Mr. Underwood:

I object to that, on the ground it is the same type of question to which your Honor sustained objection before. * * *

(The question was read.)

The Court:

Do you mean, Mr. Matteson, to inquire—to make this question the basis for comparison of the different kinds of examination made?

Mr. Matteson:

Yes, sir. He has talked about two kinds of classifications, two kinds of surveys; and I am trying to draw out what the difference between them is.

The Court:

I think that goes to the question of the examination, the character of examination he made. I will overrule that objection.

(Argument by counsel.)

Let me ask the witness a question, and that will help me rule. That is a technical question, I think, Mr.—Captain Bernard.

A. Yes, sir.

The Court:

I will ask you, would that help the Court in determining the degree of thoroughness of your investigation of the Seminole?

A. I don't think it applies, sir.

The Court:

Well, I sustain the objection; reverse my ruling.

(By Mr. Matteson):

Q. You are familiar with the rules of Lloyd's Register of Shipping, with respect to composite and steel yachts, a copy of which has been marked Libelants' Exhibit 101, are you not?

A. No, sir, I am not, that's the first time I ever saw that.

Q. Well, does that also apply to this other book, construction and classification of wooden yachts, Libelants' Exhibit 101-A?

A. I might get a pamphlet from that particular volume, but I am not familiar with the volume. If I had work to do I might get a pamphlet that would be an extract from some rule there, or some necessary required examination.

Q. Well, are you, do I understand, now making a Lloyd's survey of a yacht here in Miami?

A. Yes, sir.

Q. And are you guided by Lloyd's rules in making that survey?

A. I am, from the office rules and the forms from the office covering that. I am not taking it—it is the result of a determined formula, or rules and regulations set up as required, to put that vessel in class.

Q. Well, do you mean that you have the rules of Lloyd's applicable to that yacht, in some other form than we have here?

A. Yes, sir, have it in a pamphlet form. I don't have to have it in that big book form.

Q. Have you a copy of that pamphlet with you?

A. I have, yes. I don't think anybody here has seen them before, but that's the way I am working on that job. That's a number-1 classed.

Q. Well, what are these rules that you have produced, Captain?

A. What are they?

Mr. Underwood:

I object to the witness being asked what papers are, unless the papers are in evidence.

A. I can't describe them, sir. They are a portion of the rules and regulations required by Lloyd's to guide a

man that they send out on a particular job; and some of that job may have been done by some other man that may come here, and I have a record of what the other man did, and I have a record of what I should pick up now; and when she goes to the west coast, the other man will have a record of what the last man didn't do. That doesn't apply to all of this.

Mr. Matteson:
I would like to have these marked for identification.

The Witness:
I can't take those; I have got to return them where I got them. I will type them out.

Q. Could we borrow them long enough to photostat them?
A. They have got two books that have the same thing in them. I don't need to give those up.
Q. I think they must be in here. See that red book over there? I guess you can get it, or the green book underneath there.

Mr. Botts:
That blue book, I think that is the one.

A. You will find them along here; special survey number 2, periodical surveys.
Q. Well, those don't seem to be like these that you have shown us.
A. This is a ship, see, steel vessel. That is pertaining particularly to the small type of yacht. They have eliminated, see, some of the rules that would not apply to that sized vessel, and they have made it up in a pamphlet to make it easy for the man, or the owner, on the job, or something for the man to stand by so the owner will know what he has to contend with.

Q. Well, would you have any objection to our borrowing this from you just long enough to have them photostated?

A. I borrowed them from someone else, I don't know what I am going to do about that. I can type them and give them to you, but I am not going to let them go out of my hands. I have got an office, I will go and type them. I am honorable that way, when I get anything I am going to hold onto it and return it.

Q. Will you do this for us, Captain; will you, when you get back to your office, call the Biscayne Engineering Company and ask them to make photostats of these and send the bill to me?

A. All right. I am going on the job when I get out of here.

Q. Now, Captain, you made the statement that these rules that we have just referred to, do not apply to the Seminole; what do you mean by that?

A. She is not a classed vessel.

Q. That's all you mean by that?

A. Yes.

Q. You are familiar with these regulations governing marine fire hazards?

A. I could refer to them. I should think that they contain what I am after. I am not familiar with them, I don't have them by heart, but I know they exist in there, the various rules. They might wish me to become familiar with them.

Q. I am referring now to Libelants' Exhibit 97. Do you use those rules in your business?

A. When they apply, yes, sir.

Q. And in making the examination of a yacht for insurance purposes, do you consider those regulations apply?

A. Yes, they apply; not compulsory, I don't think. They are established.

Q. Are they the rules that you follow?

A. No, sir, they are not; I don't always follow them to the detail, no, sir.

Q. Well, what are those rules, Captain?

A. Well, they are rules and regulations governing marine fire hazard, indorsed by the American Marine Standards Committee, National Board of Marine Underwriters.

Mr. Underwood:

Captain, when you made that answer you were reading from the cover of the pamphlet, were you not?

A. Yes, sure.

(By Mr. Matteson):

Q. Well, then do I understand you to say that when you make a survey that you understand is to be used for insurance purposes, you are or are not guided by those rules?

A. I am not guided by them; I try to follow them as best I can, as near as the book will allow or the job might support.

Q. And you also said, I think, that you are familiar with these rules which are entitled, Regulations for the Prevention of Explosion and Fire on Motor Boats, Approved by the National Board of Fire Underwriters, which has been marked in this case Libelants' Exhibit 24?

A. I am familiar with them.

Q. And do you apply those in your surveys that are to be used for insurance?

A. I have copies that I take with me most every survey, and try to comply with them; and those that are determined not to follow out, I will stipulate it in the end of my report, around "Something wanted".

Q. Then if you find something which does not comply with the rules here, I understand that you note it at the foot of your survey?

A. Yes, sir.

Q. Is that right?

A. I do as a rule, if there is anything, yes.

Q. You did not note in your survey of March 29, 1935, the presence of the drain valves, did you?

A. No, sir, I didn't know they were there.

Q. And drain valves are one thing that are prohibited by these rules of the National Fire Protection Association,—drain valves in the engineroom, is that not right?

A. Yes, sir, I think there is a paragraph there; draw-off—they mention them as draw-off; draw-off from the gasoline line. I think you will find it there on the second page, item 14, maybe.

Q. Yes, here it is, on page 4 of the exhibit 25, paragraph G; outlets on gas feed line for drawing loose gasoline for any purpose whatsoever, are prohibited in the engineroom compartment.—I would like to ask you this question; you say that you did not note this in your report, and you have given two possible reasons for not noting it in your report; one, that you didn't see them, didn't know they were there; and the other, that sometimes you don't note things when you regard them as extreme. Now which was the reason you didn't note that in this report?

A. I didn't see them?

Q. Did I understand you to say there was a shut-off on the storage batteries?

A. Shut-off?

Q. Or cut-off, or cut-out?

A. No, I didn't locate that. There must have been a cut-out by which to separate the batteries from the switchboard.

Q. You mean, on the switchboard, or somewheres?

A. I couldn't tell you where it was, I didn't locate that and I didn't memorize it.

Q. You didn't locate that?

A. I didn't try it out, but I presume I read the right way, see; it was in conjunction with the switchboard.

Q. You said something about your understanding that that vessel was to be used on a short voyage; did I understand you correctly on that?

A. That's what I understood, yes, sir.

Q. What did you understand by a short voyage?

A. Well, it was going to make a short run, a short trip somewhere.

Q. And—

A. Down to the Keys, in these waters, down to the Keys, as I remember it now. Someone said she was going to Cape Sable; as I remember it, she wished to go to Key Largo and return, with a party.

Q. And was it your understanding that it was simply for that short voyage that the insurance was required?

A. Well, it wasn't put to me that way, no, sir.

Q. Do I understand that you deny telling Mr. Hawkins that there was a plate that needed reinforcing?

A. I didn't report any bad plate, sir.

Q. You didn't mention any such thing to Mr. Hawkins?

A. No, siree.

Q. And if you had noted any such thing, it would have been important for you to have placed that in your report, would it not?

A. Oh yes, or keep away from the job until it was made good. I don't think I would have made any report; kept off the job.

(The last answer was read at the request of Mr. Underwood.)

Q. If you knew, and if you examined a vessel and you knew that she had a plate reinforced in concrete,—with concrete, would you report her in good condition without mentioning that fact?

A. I would have to mention it, yes, sir.

Mr. Matteson:
I think that is all at this time.

By Mr. Botts:
Q. I understand you went twice into the engineroom; correct?
A. I did.
Q. Were they both on the same day or did you go in the engineroom on each day?
A. I went in there on two visits.
Q. Probably on two separate days?
A. Yes.
Q. The first visit was for the purpose of examining the mechanism for the bilge pumps as I understand?
A. No, sir,—oh, yes, that is in connection with the bottom, yes, sir.
Q. And how long did you stay in there at that time, to your best recollection?
A. I might have been there fifteen minutes.
Q. And about the same length of time the second day?
A. About that, yes, sir.
Q. Now you stated that you examined her pipe lines and found them tight?
A. I don't think so, no, sir; I didn't examine the pipe lines. I might find that pipe line—
Q. You said that you found no leaks in the pipe lines?
A. I would like to know what pipe line you are referring to.
Q. I don't know, you used the expression. Well, did you examine her pipe lines?
A. If you name them I will tell you.
Q. Did you examine any of them?
A. I examined the gasoline line, yes.

Q. You examined the gasoline line. Now that included the lines from the intake on the deck, down to the carburetors, did it?

A. Well, they are not connected; they are related to one another only by distance between the tank extension or construction.

Q. Read the question.

(The question was read.)

A. I couldn't reach in and see the filling line, any more than to see the connection was tight on deck; to examine the filling line, any more than to see that there was a tight connection from the tanks to the deck.

Q. So you didn't examine it?

A. I didn't make any assertion that I had examined the fill line.

Q. You don't know whether that fill line leaked or not, do you?

A. It was intact to the deck, as required; and to search it as far as we could go.

Q. Was there any gas in the tanks when you examined her?

A. I didn't look for gas.

Q. You don't know whether there was any gas in the tanks or not. You made an examination to see whether there was a gas leak?

A. Umh, hmh.

Q. Didn't you?

A. Umh, hmh.

Q. Did it occur to you that it would be a good idea to find out whether there was gas in the tanks, before you examined to see whether there was gas leaking out of the tanks?

A. How would I do it?

Q. I am asking you.

A. I wouldn't attempt to find out whether there was gas, alone in the engineroom. I presume there was gas there.

Q. You presumed there was gas?

A. Yes.

Q. But you don't know?

A. No, I don't.

Q. Now then did you examine to know there were shut-off valves at the tanks, between the tanks and the carburetors?

A. Shut-off valves on the tank.

Q. Between the tanks and the carburetors?

A. There were shut-off valves at the tanks and at the carburetor.

Q. All right now, then, did you examine those valves to find out whether they were opened or closed?

A. No, sir, I did not handle them.

Q. They might have been wide open so far as you know?

A. And they could stay that way as far as I was concerned; I wouldn't touch them.

Q. I am just trying to find out what you did.

A. I would not manipulate them, see.

Q. I am not asking you what you would have, I am trying to find out what you actually did do; that is what I am trying to get at. Now then you didn't try manually, with your hand or otherwise, a single valve anywhere in that pipe line system, did you?

A. No, I didn't.

Q. And did you go into the tank compartment?

A. I couldn't get in there.

Q. There was no way that you could get in there, was there?

A. Might get a look in, get your eyes up in there and get a scant view of the side of a tank.

Q. But there was no way by which you could really make an examination of those tanks to determine whether or not they were tight, was there?

A. No, sir, there was not.

Q. And you didn't attempt to make such an examination, did you?

A. No.

Q. All right.

A. What I did, to prove those tanks were not leaking, was to see there was no evidence of gasoline odor or a drip or drain in the bilge; that's why I followed the bilge.

Q. So far as you could tell from the examination by the physical situation permitted, you found no leak, is that it?

A. No leak, no; the tanks were tight.

Q. Now since you don't know whether or not the gas if any in the tanks, was cut off at the tanks, you won't know whether or not there was any gas in the gas lines at the time you made the examination, do you?

Mr. Underwood:
I object to the question as speculative.

Mr. Botts:
Strike it off.

Q. Do you know whether there was gas in the gas lines from the tanks to the carburetors when you made the examination?

A. I believe there was, yes.

Q. Well now, what makes you think so, if you don't know whether there was gas in the tanks?

A. Well, we will presume there was gas in the tanks. I know there was gas in the tanks.

Q. Well, how do you know it?

A. I can't tell you what elevation there was, but you could tell whether a valve was started from its seat by its valve system,—to an engineer.

Q. But you didn't touch the valves, you say?

A. I didn't touch them.

Q. As a matter of fact you don't know whether there was any gas in those gas lines or not, do you?

A. I presume there was gas.

Q. You presume there was, but you don't know, do you?

A. No, I am not positive.

Q. All right. Then isn't this a fact; that all you can say is that you saw no gas leak? Isn't that about as far as you can go?

A. Yes, I can say this; that I saw no evidence of there having been a gas leak.

Q. All right. You didn't touch any of the valves to see whether they were opened or closed or their condition? Did you touch any of the pipe lines?

A. I went over the pipe line, yes.

Q. How?

A. Went along it, observed it by the light,—flashlight I had in my hand.

Q. Was the engineroom dark?

A. It wasn't any too light.

Q. This was in the daytime, wasn't it?

A. Yes, sir.

Q. The shades pulled on the windows, were they?

A. I don't know, I didn't observe any shades on any of the windows.

Q. Well, the engineroom was so dark that in order for you to make any sort of an examination you used a flashlight, is that right?

A. It is customary to carry a flashlight in a place like that.

Q. Did you use your flashlight?

A. I might have used it from habit, yes, sir.

Q. You don't know whether you used the flashlight or not?

A. I don't know whether I turned the button on at that particular time, or no; but I believe I did.

Q. Now isn't it true that your examination was very superficial?

A. No, sir.

Q. You didn't look around carefully to see what was in that engineroom, did you?

A. I did.

Q. I wonder if you saw the valve here that has been— I am referring now to Libelants' Exhibit 11, did you see that pair of valves in the engineroom anywhere?

A. I think—that is the overflow valve; I wouldn't recognize those valves, but I know from what I have heard that those are—

Q. Did you see those valves?

A. I can't remember whether I saw them or no. There may be others like them, I may have seen other valves, I couldn't tell; I don't have that in mind, five years.

Q. I call your attention to Libelants' Exhibit 13, the gasoline can; did you see that can in the engineroom?

A. No, sir.

Q. I call your attention to Libelants' Exhibit 14, the top part of a funnel; did you see a funnel—

A. I can't recognize it. I didn't see any funnel.

Q. You didn't see anything of the kind. If the three objects to which I have called your attention, namely, the pair of valves, the gasoline can and the funnel, or any one of them, were in the engineroom, it didn't sufficiently impress you that you have any recollection of it; is that right?

A. No, sir, I don't recollect them.

Q. You have no recollection of them. Now you have stated that you examined the switchboard, and that the switchboard was in good condition, is that right?

A. I didn't say the switchboard; I said the switches. But I said the switchboard and all the conditions were what would be considered a good switchboard. I didn't have time to examine the switches. That is just the switchboard in general.

Q. Well, I made a memorandum, I don't want to go back to the testimony, but didn't you say in your direct examination that you examined the switches and that they were in good condition?

A. Examined the switchboard and the connections.

Q. You didn't examine the switches then to find out whether they were in good condition?

A. I didn't see anything the matter with them.

Q. Wait a minute now. Did you examine the switches?

A. Yes, why I examined the switchboard, I didn't detail every switch; I made no observation of the condition of the other switches on that particular switchboard.

Q. You just walked up to the switchboard and took a glance around?

A. I went there in a hurry, yes.

Q. Glanced around hurriedly?

A. It doesn't take a man that knows, to know to read a switchboard if it is wrong.

Q. Well, you are not here as an expert, so I don't know whether you know or not. So far as you observed, the switches were in good condition?

A. Yes, sir.

Q. Now when you said that you observed the location of the switchboard and that it was well above the floor, which is essential,—to use your language. Why is it essential to have the switchboard well above the level of the floor?

A. Well, it is a precautionary measure, to keep knife action or spark conditions away from low places, and in the event of an accumulation of vapor or gases that might be hazardous.

Q. Now then where is that blueprint?—I understand that you examined the bilges very carefully and went through all parts of them, and made a particular examination as to the bilges; is that right?

A. I examined them. When I examined them why I examined them, that is all; I don't say, very carefully, very carefully.

(At 12:30 o'clock P. M. the hearing was recessed until 2:00 o'clock p. m. of the same day, May 19, 1939.)

May 19, 1939, 2:00 P. M.

Afternoon Session.

2832 Thereupon E. GEORGE BERNARD, a witness produced by the Respondent Phipps, resumed the stand and was examined and testified as follows:

Cross Examination (Cont'd.).

By Mr. Botts:

Q. Captain, you recall the little alleyway to the starboard of the engineroom, don't you?

A. Yes, sir.

Q. Now then do you recall the construction of the partition between the alleyway and the engineroom?

A. Do you mean the shape or—

Q. Do you recall the material of which it was constructed?

A. Steel, I believe.

Q. Now I want to ask you if there were four two-inch ventilators that passed up and went by that partition and up through the deck of the engineroom?

A. I didn't see that; they may have been but I don't know.

Mr. Underwood:
Wait a minute. Let him finish. If your Honor please, I will ask you to instruct Mr. Botts not to interrupt the witness. He has offended very seriously in that respect and I have been very patient about it.

The Court:
I think the witness ought to finish his answer.

Mr. Botts:
Certainly I will let him finish.

Mr. Underwood:
May we have the answer read?

(Thereupon the preceding answer was read by the Reporter as above recorded.)

The Court:
Did you finish your answer, Mr. Witness?

The Witness:
Yes.

The Court:
All right; proceed.

Mr. Botts:
Now, do you apologize?

Mr. Underwood:
No, I do not.

(By Mr. Botts):
Q. You went down into the bilge, did you?
A. I was in the bilges, yes.

Q. Now were there four ventilators, two inch ventilators, from down below the bilges, in the bilges and along about where that partition was and running from the bilges up into and through the deck of the engineroom?

A. In which bilge space are you referring to?

Q. Approximately underneath the engineroom?

A. That would be the engineroom bilge space?

Q. Yes.

A. I didn't see any pipe.

Q. Were there four more over on the port side?

A. I believe I have answered that question, sir.

Q. I asked you on the starboard side. Now I asked you if there were four more on the port side?

A. I didn't see any pipe.

Q. You examined all down there, didn't you?

A. I examined the bilges in regards to the condition of the hull but not as to the—

Q. Did you examine them with reference to ventilators?

A. I did.

Q. You say you did?

A. Yes.

Q. Then if there had been ventilators there you would have seen them?

A. They would have been pretty small ventilators if they were intended to ventilate the bilges—two inch ventilators.

Q. You saw nothing of that kind?

A. No.

Q. Now was there any ventilation in the tankroom space?

A. Will you name the tank space?

Q. The main tank-room space just forward of the engineroom?

A. I can't remember whether I checked that or not.

Q. As a matter of fact, Captain, an examination for insurance such as you were making is not a complete examination by any manner of means, is it?

A. In what view is it not complete, sir?

Q. In any respect is it a complete examination?

A. Complete examination? I don't know what you are drawing the line on as to complete examination. I thought we had that kind of an answer this morning.

Mr. Botts:

Read the question, please, Mr. Reporter.

(Preceding question read by the Reporter as above recorded.)

(By Mr. Botts):

Q. Would you mind answering that question and then make any explanation you desire?

A. Our purpose in making such examination is to try to fill out the application to direct the underwriters to ~~the~~ general condition of the vessel, particularly applications for insurance.

Q. Is that examination a complete examination or not?

A. It was in so far, as that was concerned, that type of examination.

Q. That type of examination?

A. Yes.

Q. It is not a very thorough examination, however, is it, Captain?

A. Are you referring to me personally as to what I did or what is required on that application?

Q. What you did?

A. It was the best of my intention to fill that requirement.

Q. Did you make a thorough examination of that engineroom?

A. That was in my mind to do and I believe I did. I did the best I could under such an examination, such a form of examination; I didn't strip or open her up, and I wasn't required to do that. It was a dead-job and without an engineer; I did the best I could.

Q. Captain, I don't want you to misunderstand me: I am not criticising your examination, but I am trying to develop its character: when you examine for insurance you make a rather casual examination rather than a thorough examination, and isn't that the ordinary practice of every surveyor?

A. I am sure I cannot answer that; that is outside of my reach. I can't answer for anybody else, and I can't answer for the rules and regulations of the Underwriters.

Q. As to yourself, Captain, isn't your examination for insurance rather casual than thorough?

A. In my position I don't believe I can accept any form sent out by the Underwriters to be filled out. I do not criticise that but—

Q. You do not seem to understand my question.

(Preceding question read by the Reporter as above recorded.)

A. If you can give it to my direct I can answer it; if there is any man who can answer it I can.

Mr. Botts:

Would you mind repeating my question, Mr. Reporter?

(Question re-read by the Reporter as above recorded.)

A. If I could understand it I would be willing to answer it.

Q. Can't you answer that, Captain? You seemed to answer in detail on your survey.

A. I can't do it because I have no subject in front of me to work on. If you will put before me a definite subject to work on, I will try to answer you, but you haven't given me anything to work on. You have asked me a question and you don't seem to understand it yourself.

Q. That is what I am trying to get you to explain, so that I will understand it. I will ask you again, Captain: When you examine a vessel for insurance do you make a thorough and complete examination? You can answer that yes or no, and then you can explain it to your heart's content.

A. I make an examination to ascertain the facts, whether there is a claim or where the necessities require you to make it complete in one way or another. Every examination is not the same because each and every particular ship design is different and they have specific requirements. We are supplied with a book of rules and regulations and we try to comply with them.

Q. Did you make a complete examination of the Seminole for this insurance?

A. When you say "Did I make a complete examination", I would say that I didn't open up any machinery and parts of this ship, and I wouldn't consider it a complete examination without I did.

Q. When you were down in the bilges did you crawl down into that portion of the bilges below the engineroom?

A. Below the engineroom?

Q. Yes.

A. No; I am too big to go in there.

Q. So you don't know what was below the engineroom floor?

A. Yes; I can get my head and shoulders into these two compartments or spaces, and if they are clean I can

by such observation as required readily ascertain the conditions.

Q. When you were down in the bilges, then, as I understand it, you looked down under the engineroom floor but didn't crawl down underneath, is that right?

A. I would say that I would have if I could, but I couldn't.

Q. You looked but you didn't get down there, is that true?

A. Yes, that is true.

Q. Now when you were in the engineroom you didn't take up the sections of the floor that are said to be removable in order to look down underneath here?

A. I can't remember; I can't remember the type of floor it was; whether it was board or plating or whatnot, but I was able to remove them enough to convince myself that the conditions were right.

Q. Did you remove some portions of the—

A. I can't remember, but I know I convinced myself they were all right; I would say they were all right.

Q. What did it take to convince you that things were all right?

A. Existing conditions and what I could observe.

Q. Now then did you examine all of the gasoline pipes from the tanks to the engines and carburetors?

A. I believe I answered that question before, sir.

Q. Just humor me by answering it now, will you? I haven't asked it before.

The Court:

Even at the burden of repeating, you had better answer the question again, Captain.

A. I examined the gasoline line from the tanks to the engines and motors.

Q. Were any portions of those lines that you examined underneath the floor?

A. I can't remember that. I have been on a good many vessels since that was done.

Q. In order to know that you had examined these lines you had to trace them from the tanks to the various carburetors, didn't you?

A. You could see them, sir; you could follow them almost with your eye while standing in one place.

Q. If they were in the engineroom you couldn't?

A. No.

Q. I mean if they were under the engineroom floor you couldn't?

A. No.

Q. Did you take up the engineroom floor to examine those portions that were underneath the engineroom floor?

A. These movements or actions of mine I can't remember exactly but I know I convinced myself that they were all right.

Mr. Botts:

That is all.

(By Mr. Matteson):

Q. I think you said, Captain, that the Seminole was not a classified vessel?

A. She is classed but I would not say she was a classified vessel. I would not say she was not classified; I would say she is not a classed vessel.

Q. There is no reason why a vessel like the Seminole could not be classed if the owner asked to have her classed and was willing to undergo the expense of it?

A. That would have to be determined by the Committee through survey upon application being made by the owner to the Committee of Lloyd's; in other words, she might or might not be able to meet the requirements.

Q. I am not speaking so much as to whether the Seminole could pass such an examination or not, but I mean with respect to a vessel of the type of the Seminole there is nothing to prevent the owner making application, is there, and if she could pass the examination she would be classed, is that right?

A. I cannot tell you what would be required by Lloyd's to classify that type of vessel; I really cannot answer that in an intelligent manner.

Q. Any vessel can be classed if she can pass the examination, is that right?

A. They would always be classed if they could afford to meet the expense. It makes a difference whether a yacht was designed originally to be classed, to be a classed vessel; it makes a difference as to whether she was constructed with the intention of being classed, or whether they were just trying to make a vessel of her, without any thought of classing her. Sometimes it is a matter of little difference to the owner.

Q. If she is of such construction that she would not come up to Lloyd's specifications, then there would be no use of making application, is that right?

A. Well, they might be able to arrange it by compensating for the beams or girders or stringers or deck plates or bulkwark plate so as to allow it to come within the classification requirements of the vessel. That would be a lot of trouble and would entail an abnormal expense, and it might not warrant you in spending that much money to get the vessel into that classification.

Q. Any vessel can be classed if she is sufficiently well built to meet the requirements and can pass the usual examination, is that right?

A. That question is something like the situation that exists today with the United Fruit Company; they have three or four of the finest passenger vessels carrying freight, because the requirements of the United States

Steamship Inspection Bureau cannot be met with; it would cost $285,000.00 to meet the requirements of the United States Steamship Inspection Service to allow passengers to run on that vessel—

Q. Now, Captain, we seem to be talking at cross purposes here.

A. I am trying to explain to you, sir, that the cost is prohibitive; that is what I am trying to explain.

Q. The simple question that I am trying to ask you is just this: Any vessel can be classified if she can meet the requirements, whatever they are, by construction, alterations or whatever it may be—any vessel can be classed if she can meet the requirements; is that right? Just answer my question yes or

A. The structural features of the vessel would not warrant the opening and changing to make her meet the requirements.

Q. That is something else, Captain: Now I will ask you the same question again. I think it is very simple and you can answer it yes or not: Isn't it a fact that any vessel can be classed if she can meet the requirements, structurally or otherwise?

A. I don't know. I don't think that is right because Lloyd's require, when you make application, a detailed drawing of your keel, specifications as to the thickness of your plate and the frame of the vessel, and the position of your bulkheads and so forth, before they would be interested in classifying her.

Q. You keep telling me, Captain, about the things she would have to have in order to meet the test.

A. There are some other things involved, and I don't think the owner would want to pay for it.

Q. Anybody could make application if they wanted to go to the expense, is that right?

A. Yes, sir.

Q. Now, Captain, there has been quite a bit said here about insurance surveys and passenger vessels and passenger insurance. You were employed to make this survey by the owner or owners of the Seminole.

A. I believe the first word of that——I believe the first—

Mr. Matteson:

I just want to warn him to tell us what he knows of his own knowledge and not what somebody else told him.

Mr. Underwood:

I submit that the question asks for a conclusion. Ask him by whom he was employed.

The Court:

He said that he was told by Mr. Hawkins in both instances.

Q. You had no communication with any insurance company with respect to this survey, did you?

A. No.

Q. You had no authority from any insurance company to pass or not pass any vessel for insurance?

A. No, sir; that could not be.

Q. You never had that?

A. I never had such an order.

Q. So this survey, as I understand it, insofar as it is called an insurance survey, was a survey that you made for the owners which they could use in connection with their application for insurance, is that right?

A. I was going to tell you about that when you interrupted me. That is what I was bordering on when you interrupted me.

Q. I don't want to know anything that somebody told you. I want to know what you yourself know.

A. I understand the owners' representative made application for the insurance, and they had to get a survey report, and they asked me to make out a survey report, and that was made out and delivered; I don't know where it was delivered, whether it was delivered to the agency in Miami or whether it was delivered to Mr. Hawkins. I just couldn't tell you that, but they handled the insurance work on that through a local agency and since then I found out that it went to Chubb & Sons in New York.

Mr. Matteson:
I move to strike that out, if your Honor please.

The Court:
The motion is granted.

Q. You were paid by the owners of the vessel for your survey?
A. I am not sure of that, but I believe I was, sir; I was paid for it but I am not certain who it was from.
Q. Did you observe when you made a survey of the vessel that the feed line to the small generator on the port side of the engineroom was connected to the bottom to a trap or drain like this which has been marked a part of Exhibit 17?
A. What?
Q. I asked you did you observe that the gasoline feed line that led to the small generator on the port side of the engineroom was connected to the bottom of a trap or drain such as the one which is a part of Exhibit 17?
A. I can't remember that; I can't remember a detail like that.
Q. You are familiar with this kind of a drain?
A. It is a strainer body, I take it to be.

Q. You cannot tell us whether or not at the time you observed that feed line it was connected to the bottom of a trap like this?

A. No.

Q. If you had noticed that you would have put it in your report?

Mr. Underwood:

I object to that as speculative.

The Court:

Sustained.

Q. I show you this paper and ask you if that is your signature at the bottom?

A. Yes; sure that is my signature.

Q. Is that your handwriting on that page, too?

A. Yes.

Q. There are several questions on the page and the handwriting constitutes answers to the questions, is that right?

A. I don't remember anything about that, but if something is there as being said by me I would want it correct. That's an opinion there, isn't that an opinion?

Q. Yes, it is.

A. Well, I think it is right, and I haven't said anything different from that.

Q. I am not suggesting that you have, but these are your answers to these questions, is that right?

A. Yes, sir; I don't recall them but that is my signature there.

Mr. Matteson:

If your Honor please, I would like to make a formal offer of this paper. I realize that under the ruling you made sometime this morning that probably it will be excluded, but I would like to make the formal offer, and if it can-

not be admitted then I would like to have it marked for identification so that it will be a part of the record.

The Court:

All right; let it be identified now. Out of the regular order of procedure that has been announced, you wish to make the offer at this time?

Mr. Matteson:

Yes, your Honor.

Mr. Underwood:

I object to it on the ground that it calls for an opinion of an expert and is not proper cross examination, and I have not called him as such expert.

The Court:

I have permitted cross examination along the line indicated by question number 1 in this written sheet. Question number 3 calls for an answer which is contrary to the ruling I have previously made, therefore I exclude the instrument insofar as question 3 is concerned.

Mr. Matteson:

We appreciate that that is in accordance with your ruling this morning.

The Court:

It speaks for itself insofar as I think Question number 1 is pertinent, so I think the purport of the ruling will be carried into effect if I deny your application to admit that in evidence.

Mr. Matteson:

Yes.

The Court:

All right.

Mr. Matteson:

Then may we have it marked for identification at this time.

The Court:

Yes.

(Thereupon the document above referred to was marked Libelants' Exhibit 120 for Identification.)

Mr. Matteson:

Now, if your Honor please, there is one other thing, and I do not want to elaborate on or attempt to re-open the question that we argued this morning, but I would like it to appear on the record that there are a number of other questions exactly along the same line that I would like to have asked, but which I did not feel I could do under your Honor's ruling.

The Court:

All right.

Mr. Matteson:

And I would also like to make it clear that my position will be that, inasmuch as Mr. Underwood has objected to the examining of this witness as an expert on whom he relies, I shall argue that he is not entitled to rely on him as an expert for any purpose at all.

Re-Direct Examination.

By Mr. Underwood:

Q. Captain Bernard, you have told us about a survey that you are making on a boat now, which you described, I think, as a classification survey; is that correct?

A. Yes.

Q. You said that you didn't find any engineer on the Seminole when you made your examination?

A. That is correct.

Q. Did you send for one?

A. No, sir.

Q. Did you consider that necessary to your work at that time?

A. No, sir.

Q. As I understand your testimony, when you gave answers to Mr. Matteson's questions, you concluded that there was no electricity on the switchboard solely from the fact that you saw no light burning, is that right?

A. Yes.

Q. Do you remember telling me this morning that you saw all four of the gasoline tank valves where they led into the gasoline manifold?

A. Yes, I hand-reached them.

Q. Will you tell us what you mean by that?

A. By hand-reach I mean so you can reach with your hand. Sometimes they are put in a place like off to the side but you could put your hand in there and reach them all right.

Q. Did you say that each one of these valves was hand-reached?

A. Yes, sir.

Q. I show you Libelants' Exhibit 9 which, I think it is fair to say, is a picture taken after the fire on the Seminole, and I call your attention to the aperture in the bulkhead marked number 1, which is a hole through which the gasoline feed line came from number 1 tank; do you note that?

A. Yes.

Q. And the valve was stationed there (pointed)?

A. Yes.

Q. I call your attention to the fact that the hole through which number 2 tank feed line led is marked number 2?

A. Yes.

Q. Do you see that?

A. Yes.

Q. Do you see the shelf there indicated on this picture?

A. I see some kind of an obstruction there; I can't definitely say what it is, but I know you had to go under it.

Q. Do you remember a desk on the forward bulkhead?

The Court:

Let me suggest that you not lead him, Mr. Underwood. Just ask him does he remember a desk there.

Q. Do you remember a desk in the engineroom?

A. No.

Q. Do you remember what was to the right of this shelf which was on brackets shown in Exhibit 9?

A. Is this to port or the center line of the ship.

Q. It is to port. I think it is fair to tell you that.

A. You are asking me about something to starboard.

Q. Yes; what was next or starboard—.

A. There is something like a large obstruction there. If that is shelving it would really have to be for batteries.

Q. You see this in this corner (pointing)?

A. Yes, sir.

Q. Do you see in this photograph, Exhibit 9, a bracket which might be for a shelf?

A. Yes.

Q. Do you remember what that was for?

A. No, I don't.

Q. I think it is fair to tell you that the evidence shows that the batteries were on shelves that were in that corner.

A. All right.

Q. What I am trying to get at is whether you remember what was between the shelf that the batteries were on and the shelves on the brackets shown in Exhibit 9?

A. I don't remember.

Q. You did look at the valve which came to the manifold from number 2 tank, did you?

A. Yes.

Q. And you saw that?

A. Yes.

Q. Do you remember now whether there was anything between where you stood and that valve on number 2 tank when you saw that valve?

A. I can't visualize what it was; I don't know; it is too long ago to remember that.

Q. Captain, is your eye-sight good?

A. I can compete with anyone.

Q. And you were using your flashlight?

A. Yes.

Q. And your examination was conducted after sunrise?

A. Early A. M., yes.

Q. Was the Seminole under any shed?

A. No, sir.

Q. Was she along side any pier with a shed on it?

A. No, not that would obstruct any possible light—any light that could come in came in where it was possible to come through that side window or overhead.

Q. Nothing obstructed the light from the port window or through the skylight in the top of the engineroom?

A. I am not sure whether the skylight was opened.

Q. Light would come through it whether it was opened or not, would it not?

A. Light would come through the side window, I believe, but I don't know where else it would come in there.

Q. Did you see these two valves between you and the valve to number 2 tank when you looked at the valve to number 2 tank?

A. No.

Q. Don't you remember a desk immediately to the right of the valve to number 2 tank?

A. No.

Mr. Matteson:

These questions are leading, if your Honor please.

The Court:

I think they are and I think they are contrary to the ruling of the Court. This is re-direct examination and I think you are confined to non-leading questions, Mr. Underwood.

Q. Do you remember whether or not you followed the manifold to its end?

A. Gasoline manifold?

Q. Yes.

Mr. Matteson:

If your Honor please, I think that is leading, too.

The Court:

No, I don't think that is leading, but I think he has answered it, if I remember correctly.

A. I have answered it, sir.

Mr. Underwood:

I will withdraw the question.

Q. How far did you follow that manifold?

A. The manifold proper from the tanks is almost visible from one standing place, if you wanted to locate yourself on either side of the center line of the ship.

Q. What was at the starboard end of that manifold?

A. A line leading aft from the motors; main feed line.

Q. You remember just one line?

A. Yes; the feed line ran in that direction.

Q. What was at the port end of the manifold?

A. I believe a valve came out of the tank and turned in the end port tank and went in and form a manifold. Of course this is a long time back.

By Mr. Matteson:

Q. Did you see any trays under the tanks?

A. Trays?

Q. Yes.

A. There was some bedding or something there, but I just could not make out what it was, and I made an inquiry of a young fellow that was there, and I asked him if he thought there were trays under there. I asked him if he had been in the engineroom, and he said that he went in there sometimes, and I just referred to him like this, "I believe there are trays under those tanks or the tanks are sitting in some kind of a tray"; I can't remember whether I said it was a whole one or a divided one. I just didn't come to a decision as to that.

Q. Did you consult that boy who was there about anything else in the engineroom?

A. No. He was only a young man and I met him here the other day in the hall; that is the first time I met him since that occasion, and he introduced himself.

(By Mr. Botts):

Q. Well, Mr. Bernard, did you get any information with reference to this boat from anyone or from any source other than your own observation?

Mr. Underwood:

I object to that as immaterial, and it is improper cross examination.

The Court:

Do you mean by that did he base his report that he did make on information other than that which he himself obtained?

Mr. Botts:

That is correct.

The Court:

I think he can answer that. The objection is overruled.

A. No, sir; it is wholly and solely on my own findings, observation and writings.

Mr. Botts:

That is all.

Mr. Matteson:

This survey, as I recall it, was marked as an exhibit and received in evidence for the sole purpose of showing that the report was received. I think that is clear in the record, but if it was offered for any other purpose, then I would want to cross examine about it.

Mr. Underwood:

That is correct. There is no disagreement about that. It was received for the sole purpose of proving that there was a survey.

The Court:

All right.

Mr. Underwood:

Now, if your Honor please, I offer in evidence Exhibit 3-Q for identification, which Mr. Hawkins identified as a copy of the policy of insurance which was taken out following the survey by Mr. Bernard, and I offer it solely for the purpose of proving that the vessel was insured at that time. There is some writing up here that I will not read to you, and which I know my friends will object to, so I do not offer the typewritten "Seminole Boat Company" over to the left in the top of the document.

Mr. Matteson:

I object to it as incompetent, irrelevant and immaterial. I do not think that the fact that this vessel was insured

by any particular company or at any particular time is a relevant fact in this case.

Mr. Botts:

I join in that same objection. I think it is illustrative of no material issue in this case.

The Court:

Ruling reserved.

Mr. Matteson:

It remains marked for identification and ruling on it is reserved?

The Court:

That is correct.

Mr. Matteson:

Mr. Bernard had these pamphlets and he agreed to permit us to have photostats made of them, and I ask that they be marked for identification, and I would like to suggest that two numbers be left open on the record for them.

The Court:

All right; leave two numbers open there for them.

(Thereupon the Hearing was Adjourned to 10:00 A. M. October 9, 1939.)

Miami, Florida, October 10, 1939, 10:00 o'clock, A. M.

Morning Session.

2856 Thereupon: WIRTH MUNROE was called as a witness in behalf of the Respondent Phipps, and being first duly sworn, was examined and testified as follows:

Direct Examination.

By Mr. Underwood:

Q. Your name is Wirth Munroe?

A. Yes, sir.

Q. W-i-r-t-h M-u-n-r-o-e?

A. Yes.

Q. Where do you live?

A. In Coconut Grove.

Q. How long have you live in Florida?

A. All my life.

Q. What is your business?

A. I am a yacht designer and marine surveyor.

Q. How long have you been in that business?

A. Since 1929 for myself.

Q. What was your experience with yachts prior to that?

A. Well, my father was a yacht designer and I spent—of course grew up with him—and worked for him, and have been in and around boats ever since I was old enough to handle it myself.

Q. What work did your father do that you participated in?

A. Well, he was a designee, and I participated in that with him, what work I could do at that age, and also in repairing. We had a small marine railway and did a lot of

rebuilding and installation of motors on both power and sail, and any kind of yacht repairing.

Q. Have you worked or did you work with anyone else prior to going into business for yourself?

A. Yes. I was—what you might call—an apprentice with Mr. N. G. Herreshoff, of Bristol, Rhode Island. He spent all of his winters here for about eight years around our place, and we did some of his designing here, and I was an apprentice to him.

Q. How long have you been familiar with power yachts and had to do with them,—over a period of how many years?

A. That is rather hard to say, because I have been with them all of my life; I don't know just when I started.

Q. About how many years?

A. Well, I would say twenty-five years.

Q. And where has that experience been?

A. Right here in Miami; a majority of it here in Miami.

Q. You said something about being a surveyor; have you been regularly employed by anybody as a surveyor?

A. Well, I have been on call for two insurance companies, and whenever they have a survey to be made I am notified to go out and make it.

Q. What type of survey is that?

A. That is for insurance, and the general condition of the boats; for fire and also for maintenance and operating.

Q. Are you familiar with gasoline motor installations on power boats and auxiliary boats in these waters?

A. I am.

Q. On what type of boats particularly?

A. Particularly on auxiliaries where there are gasoline motors; of course today we are installing Diesels mostly.

Q. Are you familiar with the standards of practice and care followed in the construction and maintenance of power vessels in these waters?

A. I am.

Q. You have spoken of being a designer; what type of boats do you design?

A. Primarily auxiliaries and power vessels, gasoline driven or Diesel driven.

Q. Does that include vessels that have gasoline motors and gasoline tanks?

A. An auxiliary, in my term, is a vessel that is driven both by sail and power, primarily by sail, but they have gasoline motors or Diesel motors installed for auxiliary power.

A. I have.

Q. Have you supervised the construction of any such vessels?

Q. About how many?

A. About seven.

Q. Does that include the installation of gasoline tanks and feed lines and electrical equipment?

A. That includes everything from the time the keel is laid until the trial trip; everything that goes aboard the boat I have to supervise; I supervise practically every bolt and nail which is driven.

Q. Apart from your experience in constructing and surveying vessels that are propelled by gasoline, have you been aboard other vessels propelled by gasoline; if so, in what number?

A. Yes. I have been aboard a great many vessels in this locality. I have made it a business to go aboard as many boats as I could, because from these boats I always learn something that I might use in my own construction later on; so it is always interesting to see what someone else does and the manner in which they do it. I have been aboard, I would say, a couple hundred boats of size, and I can't tell you how many small boats.

Q. By "boats of size" can you tell us what size you mean?

A. From 40 feet up.

Q. By "small boat" you have in mind something smaller?

A. More or less open boats and boat cruisers.

Q. Since the fire on the Seminole have you examined her?

A. Yes.

Q. Have you familiarized yourself with the layout of her motors and her gasoline tanks and feed lines, switchboard and so forth?

A. I have made a very close survey of her construction; I have been aboard her several times.

Q. Did you observe whether or not it was possible to drain all the gasoline from the tanks through the feed line?

A. No, it is not possible to drain every bit of the gasoline from these tanks.

Q. What is your opinion as to the propriety of that condition?

A. The amount of gasoline that will remain in those tanks—and if not gasoline, some fluid in the bottom there—would amount to a very small amount. I figure in the entire four tanks about sixteen gallons. We very seldom—practically never today—put a draw-off at the bottom of a tank. That is put there for preventing any refuse or any small amount of water that is condensed from getting into our feed line. In these particular tanks any small amount of water in the bottom of them would lay in that V section around the edge and form a seal against any gasoline going through there. Gasoline being lighter than water, naturally it will float on the surface of the water.

Q. In your opinion were these tanks so constructed as to be a proper installation for a vessel of that class?

A. I would say that they were quite proper.

Q. Have you calculated the capacity of these tanks?

A. Yes, sir.

Q. What did your calculation result in?

A. Each tank contained 491.79 gallons. That may very a little bit, but it is very close. The tanks are 42 inches in diameter and they are practically seven feet in height. Of course there is no seven feet capacity there.

Q. In reaching that figure have you made proper allowance for the concave shape of the bottom?

A. I have, and also for the set-in of the bottoms where it is set in the side.

Q. Did you observe the comparative size of the filling line and the vent line?

A. The filling line was a two-inch pipe; the vent was half inch pipe.

Q. What is the purpose of the vent?

A. The vent is to carry off the air from the tanks as the fuel is put in. It is also to prevent any sealing when the fuel runs in, and the air naturally has to come back into the tank as the fluid runs out.

Q. Is there any reason why the filling pipe should not be four times as large as the vent pipe?

A. Yes. The filler pipe naturally has to be large to accommodate the flow of fuel or liquid as it goes into the tank; to prevent any flowing back or any dripping in the line, and especially over the filler pipe; and the vent doesn't necessarily have to be as large as the filler pipe because there is only air passing out of the vent line.

Q. Assuming that you are filling the tanks with a full stream of gasoline through the filling line, is there any reason why the half-inch vent line cannot discharge the air as fast as the gasoline comes in?

A. Air can be compressed and will naturally pass through a smaller pipe at the same rate that fluid will run down a two-inch pipe. There is another reason for having a small vent.

Q. What is that?

A. That is that when a tank is partly full it will—what we say—breathe, due to the change in pressure in the outside of the vessel or the difference in temperature

between day-time and night-time. The air is forced in or sucked back through this vent, and by keeping it as small as possible it prevents any heavy air or moisture-laden air from being sucked back into the tanks at night and condensing on the inside of the tank and getting water in with your gasoline.

Q. Do you mean to say that the smaller the vent the less condensation?

A. The less chance of getting condensation in the tank.

Q. In your opinion was this installation proper insofar as the size of the filling pipe and the vent pipe were concerned?

A. Yes, sir; it was perfectly proper.

Q. Did you observe any drip pans under the gasoline tanks?

A. Yes; there are drip pans under all four tanks.

Q. Will you describe how many pans there were and their general characteristics?

A. There are two pans under the four tanks. There are two tanks in each pan.

Q. What are the pans made of?

A. The pans are made of iron sheet steel, the exact thickness I don't know, but it is about three-sixteenths, I believe, or at least that weight. They are about four inches deep and naturally the width of the tanks; they are square on the upper or outer ends of the compartment, and they have a round end in the center; in other words, the number one and number two tanks are sitting in one pan and number three and number four tanks are sitting in another pan.

Q. Numbering them from the port—

A. Numbering from the port side.

Q. In your opinion were they of proper design and properly installed?

A. They were quite proper in design and they were properly installed.

Q. Have you been able to ascertain whether or not these pans had an overboard discharge?

A. No, I haven't been able to determine where the drain went to. There were drains in both pans but the pipes leading from that vent were destroyed due to the fire and wrecking, and I cannot determine where they went to.

Q. What did you see of the pans that causes you to say that there was something leading from them?

A. There is a pipe connection with a piece of broken pipe in it, or was in the rounded end of each pan.

Q. That is the inverted—

A. That would be near the center.

Q. The inverted end of each tank?

A. Yes.

Q. Where were these fittings with respect to the square opening in the engineroom bulkhead?

A. They were directly behind that square opening.

Q. From your examination could you ascertain what was attached to these openings prior to the fire?

A. You mean the openings in the pans?

Q. Yes.

A. No, I couldn't say, except that there was a pipe screwed into it.

Q. Were overboard drains in your opinion necessary from these pans?

A. Well, as long as there was no leak in the tanks there was no necessity for any drain to drain off any condensation or water that might possibly come from the outside of the tanks, gasoline having a tendency to keep the tanks cooler than the atmosphere at times.

Q. Did you observe how the tanks themselves were secured or held in place in the tank compartment?

A. Yes. These tanks sat on a framework of four by fours in the pans. There is a four by four going all the way around the outside edge of the pans, fitting snug into it, and there is a center-piece running athwartships or the

length of the pan or the length of the pans, running all through the middle, and in this was cut a groove for the lower edge or bottom edge of the tank to sit in.

Q. How deep was the groove?

A. Oh, about half an inch.

Q. How did the groove conform in shape to the tanks?

A. Well, it is circular, so that the entire lower edge of the tanks set right into the groove. Of course this framework wasn't circular so that the groove ran across the four by fours.

Q. You mean the tank sat on a square base and the groove was only made in that part of the square base where the bottom of the tank came in contact; is that right?

A. That is what I am trying to imply.

Q. How about any other supports that you observed?

A. There were vertical supports between the tanks; there were three of them, with a spreader running fore and aft, which was notched out to fit the size of the tank; the lower spreader is about one foot above the pan and the upper one—I can only assume—was maybe a foot below the top, but that upper one has fallen down, and it was badly charred, so I couldn't examine it; it was badly charred and had fallen down on the lower one.

Q. Have you had some photographs made to show the conditions of which you have been speaking?

A. Yes, I had some photographs made.

Q. You went there with the photographer?

A. Yes.

Q. That was last May?

A. I believe it was at the last session; yes, it was in May.

Q. Now I show you a photograph and ask you whether or not that is one that was taken of the Seminole tank compartment, or a portion of it, at that time?

A. Yes, that is a photograph which I had the photographer make of the port end of the tank compartment.

Q. Will you describe to us from what point it was taken and in general orient us so we can understand it?

A. That photograph was taken looking directly down into the compartment.

Q. And what is this white substance at the bottom of the photograph?

A. That is a part of number one tank; that is the side of number one tank.

Q. Just mark on there "number one tank".

A. (Witness complies.)

Q. Now what bulkhead is this on the right where the rivets appear?

A. That is the forward bulkhead of the tank compartment.

Q. Will you please write on there "forward bulkhead"?

A. (Witness complies.)

Q. Then what is this bulkhead at the top of the photograph?

A. That is the port side of the vessel.

Q. Will you please write "port side" on that?

A. (Witness complies.)

Q. Then this, of course, at the left margin of the photograph is the bulkhead between the tank compartment and the engineroom?

A. Yes.

Q. This we see at the bottom is the bottom of the tank's compartment?

A. That is the bottom of the tank compartment. There was still water there; it wasn't pumped out at the time this photograph was taken.

Q. So there is water at the central portion of the photograph?

A. Yes.

Q. Now I call your attention to apparently a beam of some kind; will you tell us what that is?

A. This beam running through the lower center part of the photograph is the framework inside of the pan on which the number one tank sat.

Q. Will you write the word "beam" on there, please?

A. (Witness complies.)

Q. Now what is this article that is in the photograph below the beam and actually to starboard of the beam, between the beam that you have marked and the number one tank?

A. That is a center stringer that runs athwartships through the middle of the pan.

Q. That is also a beam?

A. Yes.

Q. Will you write the word "beam" on that?

A. (Witness complies.)

Q. You have spoken of a groove in which the tank sat. Can you indicate that on the photograph?

A. Yes. You can see it finely outlined in there (pointing); this is the outside of the groove (pointing), and there (pointing) is the inside of the groove. This was all full of ash and stuff.

Q. Suppose you draw an arrow at one end of the groove and at the end of the arrow mark the word "groove".

A. (Witness complies.)

Mr. Underwood:

I offer this in evidence.

Mr. Matteson:

No objection.

The Court:

It will be admitted.

(Thereupon the photograph above referred to was marked Respondent Phipps' Exhibit 5-J.)

(By Mr. Underwood):

Q. I show you another photograph. Was that also taken of the general part of the tank compartment, with the camera pointing approximately straight down?

A. This was taken in practically the same position as the other one, of the same part of the vessel.

Q. This is the number one tank?

A. Yes.

Q. Is this the forward bulkhead?

A. That is the forward bulkhead at the right-hand end of the photograph.

Q. Does the groove appear also?

A. That groove here is very pronounced, because I had it cleaned out; it is shown there coming clear around under the forward side of the pan.

Q. Will you just draw a line with a pen all the way through the groove, starting over here at the right and then going to the left, and then mark it "groove"?

A. (Witness complies.)

Mr. Underwood:

I offer that.

The Court:

Let it be admitted.

(Thereupon the photograph above referred to was marked Respondent Phipps' Exhibit 5-K.)

(By Mr. Underwood):

Q. I show you still another photograph. Was that taken at the same time?

A. Yes, this photograph was taken at the same time as the others.

Q. Will you tell us where or about what portion of the boat?

A. This is of the tank compartment, showing the space between the number one and number two tanks and the after bulkhead.

Q. Indicating number one tank and number two tank?

A. Yes.

Q. And this bulkhead which appears in the upper left-hand corner of the photograph is the bulkhead between the tanks and the engine-room?

A. Yes.

Q. You have spoken of wooden members. Do you see any in that photograph?

A. This here in the center, running diagonally across the photograph, is the remains of one of the upright columns.

Q. Was that upright in the Seminole?

A. Yes.

Q. I will draw an arrow to it and mark it—what is the proper name for it?

A. It is a stanchion. You can also see in this photograph the remains of the lower piece or spreader that went between these two stanchions running fore and aft between the two tanks, to separate the tanks.

Q. As that installation was made, will you tell me whether or not number one tank and number two tank were both in contact with that thing that you call the spreader?

A. Both number one and number two tanks were touching that.

Q. Was that spreader shaped in any way to conform to the tank shape?

A. Yes.

Q. I will draw an arrow to that under which you have indicated as a spreader and write on it "spreader".

A. All right.

Mr. Underwood:

I offer that photograph in evidence.

Mr. Matteson:

No objection.

The Court:

It will be admitted.

(Thereupon the photograph above referred to was marked Respondent Phipps' Exhibit 5-L.)

Q. Now, bearing in mind that construction, Mr. Munroe, in your opinion were these tanks properly tight and secure?

A. They were perfectly secure. I know of no better way of holding them in there. These stanchions or uprights were fastened to the base that sat in the pan and the tanks were entirely tied together, so they couldn't upset without all of them upsetting.

Q. In your opinion could they move at all with the normal vibration of such a vessel?

A. No. The tanks had a very large base and the lower end of the tank was set in a groove, and they couldn't shift, so there would be no vibration at all. These tanks could have very easily sat there without any vibration whatsoever, with the amount of offshore work that she did.

Q. Was there any means of access for a man into the tank compartment that you could observe?

A. No; only by removing the center plate in that bulkhead between the compartment and the engine room.

Q. Do you know what type of construction was above the tank compartment prior to the fire?

A. I haven't any way of telling what was above the tank construction. There might have been hatches above there, and there may have been space where a man could have gotten in.

Q. Is there any way of positively telling now?

A. There is no way of telling now what form of construction was over the top of these tanks.

Q. Assuming that a man could not get into that tank compartment to inspect these tanks without taking out that plate with force, in that part of the engineroom bulkhead, tell us whether or not in your opinion that was a proper construction.

A. That was a proper construction.

Q. Was there any need for access to the tank compartment to test the tanks?

A. No, because these tanks could have been tested in other ways without having to see the actual tanks themselves.

Q. How, for example, could you test these tanks without getting into the compartment?

A. You can put a hydrostatic test on them.

Q. How laborious or troublesome a job would be?

A. No job at all. All you have got to do is to put a riser on the filler pipe and plug the vent pipe; put a riser on both of them and fill this riser. The riser can be the height of whichever test you want to put on, according to the maximum pressure that you want to put on.

Q. Would such a test be an adequate test?

A. Yes.

Q. Is it customarily or frequently used?

A. It is very commonly used.

Q. Could you tell by such test whether a tank leaked or whether or not it had a margin of safety?

The Court:

What is a riser?

The Witness:

A vertical pipe.

(By Mr. Underwood):

Q. By putting a riser on the filling pipe you have in mind another piece of pipe connecting to that and going up straight in the air?

A. Yes. That riser would give added pressure to the bottoms of the tanks, whatever distance you want it. You can get any pressure at the bottom of your tank that you desire by merely increasing the height of the pipe, and you could determine just what factor of safety you want

to use. You know what the normal pressure would be on the tank without any riser, and with a riser you can either double or triple that distance from the top of the tank to the bottom; you could either double or triple the pressure.

Q. Have you calculated the pressure at the bottoms of these tanks, assuming that they are filled with gasoline?

A. Yes, sir. The normal pressure at the bottom of these tanks filled with gasoline would be 2.22 pounds per square inch.

Q. Assuming that they were filled with water, what would the pressure be?

Approximately three and one-half pounds.

Q. What is the formula for calculating pounds of pressure per square inch; with water, first?

A. We used half pound to the foot of rise, or depth.

Q. In other words, a vessel filled with water a foot high will have a pressure at the bottom of one-half a pound to the square inch?

A. Yes.

Q. And a vessel filled with water two feet high will have one pound?

A. Yes.

Q. And so on?

A. Yes.

Q. The pressure at the bottom varies according to the—

A. The pressure on the bottom varies according to the density of the liquid contained in the tank. If you put mercury in there you would have a great deal more pressure on the bottom than would be the case with gasoline.

Q. These tanks were seven feet high?

A. Yes, and forty-two inches in diameter.

Q. In order to subject them to a hydrostatic test, giving them twice the pressure at the bottom of the tanks as they would normally have when full, how high a riser would you have to have?

A. Another seven feet.

Q. By adding seven feet—

A. You double the pressure at the bottom of the tank, irrespective of the diameter of the pipe.

Q. Just so that we may have some idea of this 2.22 pounds per square inch pressure, can you tell us what the ordinary pressure on a garden hose in Miami is approximately?

Mr. Botts:
I object to that—

A. In other words, from 40 to 50 pounds.

Mr. Botts:
I don't think that is material, if your Honor please.

The Court:
I am frank to state that I do not know whether it is or not at this time.

Mr. Matteson:
I don't know how the witness could know unless—

The Court:
I will let it remain and will determine later whether I should strike it.

(By Mr. Underwood):

Q. Did you observe the concave and convex ends of these tanks?

A. I did.

Q. Which is properly the bottom of such a tank?

A. The concaved end.

Q. In these tanks was the concave end up or down?

A. Down.

Q. Why is that properly the bottom of such a tank?

A. Because a grooved surface as that was, with a head on it towards the pressure, is the strongest form of support, the same as a bridge.

Q. Does the stability of the tank in place form a part of the consideration in determining which should be the bottom?

A. Yes. You couldn't very well put a convex end of the tank down and expect the tank to stay there without considerably more bracing. With a convex end you have a rim, which is square and forms a perfect brace.

Q. You said, "convex end down"; did you mean convex or concave?

A. Concave end down.

Mr. Matteson:

I don't think his testimony is very clear on that.

The Witness:

I am just a little bit mixed up in the use of these two words. I know the difference, but it is hard to put the right one in the right place. It depends on whether you are looking on the inside or the outside of the tank too. You might use the words "ends of the tank", I suppose.

Q. As the tanks were installed the bottom was the concave end?

A. That is right.

Q. I think that is the phrase that was used by the Libelants' witnesses. Now with the concave end down it is quite obvious that you have a flat bottom?

A. You have a rim; a rim that is perfectly square, and you could set it on most any flat surface and it would set upright without any support whatsoever.

Q. Have you ever seen in any boat a gasoline tank of that type installed with the other end up?

A. I never have; I have seen them on their sides too, but I have never seen them with the convex end down.

Q. Did you observe the rivets at the bottoms of these tanks?

A. I did.

Q. Can you tell me whether or not they were welded?

A. They are apparently not welded.

Q. Can you tell me whether or not they were soldered?

A. Around the bottom they were soldered. I assume from what little bit you can see—there were places all the way up to the top where a small amount of solder is still visible.

Q. Where?

A. On the seams and around the rivets of the side seams.

Q. Vertical seams?

A. Vertical seams.

Q. What would be the effect of fire on the solder?

A. Fire would melt the solder; solder has a very low melting point.

Q. How do you account for the fact that you found solder around the bottom seams and not towards the upper end of the vertical seams?

A. There was ash and stuff around the bottom of the tank for approximately 20 inches to two feet, and the solder wasn't melted in that section, and up above the heat got to it and the solder was burned off and ran down.

Q. As you examined these tanks, will you tell us whether the rivets in the bottom were soldered?

A. The rivets in the bottom seam showed an indication on the inside of being soldered, that is, inside of the bottom rim.

Q. How about the rivets on the outside of the bottom; could you tell?

A. There were small pieces of solder there; some of it has flaked off with rust. When I first examined the tank it was quite plain.

Q. In your opinion are the rivets soldered on the outside of the bottom?

A. Yes.

Q. How about the vertical seams?

A. They were soldered too. Of course, as I explained, most of that solder on the outside of the tank has been flaked off by rust, but when that tank was first removed there was no flaking and there was still signs of the original paint; there were still signs of the red lead paint around these tanks where the fire had not burned off, but since then the tank has flaked and the "air" has removed any indication of the paint or the solder.

Q. In your opinion was welding necessary on such tanks?

A. Not necessary for that use.

Q. What is the purpose of welding?

A. For strength.

Q. In your opinion were these tanks strong enough for their purposes, bearing in mind the pressures involved, without welding?

A. They were plenty heavy enough for the use that they were used for, put to; they were strong enough for a great deal higher pressures than ever applied to them.

Q. As a matter of fact, was soldering necessary in your opinion for tightness?

A. It wasn't necessary, absolutely necessary, but it was a good safety factor; it eliminated any possible chance in future of any leaking in the tank.

Q. Did you observe the relation between the bottom edges of the cylindrical sides of the tanks and the bottom edges of the bottom of the tanks?

A. Yes. The side plates of the tank projected down below or beyond a flange at the bottom.

Q. By about how much?

A. I would say roughly one-eighth to three-sixteenths.

Q. That left approximately a rectangular space?

A. That left a small space in between the two, so that the two didn't come flush.

Q. Was that space filled with anything?

A. That space was filled entirely with solder; there were a few places that were not quite filled; there was some solder that might have come on during the fire or heat.

Q. In your opinion was that space filled with solder prior to the time of the fire?

A. It was.

Q. In your opinion was it necessary to caulk the seams of these tanks?

A. Well, it is customary in the building of such tanks to caulk them if they are going to be put under any pressure, but if they were soldered afterwards and they knew they were going to be soldered or going to be galvanized afterwards, there was no absolutely necessity of caulking.

Q. What is the purpose of caulking; tightness?

A. To make the seams tight.

Q. How far apart were these rivets?

A. These rivets all over the tank, both the vertical seams and the bottom, were practically one inch apart; one inch to one and one-sixteenth of an inch.

Q. Approximately what was the diameter of the rivet hole?

A. That is pretty hard to tell. I assume that it was approximately half inch or a little less. They normally would be between three-eighths of an inch to half an inch rivets.

Q. In other words, in your opinion is that proper spacing for rivets for tanks of that type?

A. That is plenty close enough for a tank of that type.

Q. In your opinion would riveting at that distance apart make a gasoline-tight tank?

A. I see no reason why it should not; I believe it would.

Q. Considering of course the pressures involved and tanks of that size?

A. The pressure is so little in tanks of that size, tanks of that use.

Q. As to their strength, were the tanks proper in your opinion?

A. They were quite proper; more than proper and more than necessary.

Q. What can you say about the cylindrical shape of the tanks as bearing upon their strength?

A. A cylindrical object is about the strongest form of tank you can make; a sphere would be stronger, and next to that is the cylindrical tank.

Q. What is the thickness of the material?

A. Approximately three-sixteenths of an inch.

Q. And what material is it?

A. Steel.

Q. Was it galvanized?

A. It was originally galvanized steel.

Q. In your opinion is that a proper type of material and proper thickness of material for tanks to be used for gasoline in such a vessel?

A. In my experience that is plenty sufficient, quite sufficient.

Q. Did you observe that the bottom seams of these tanks were singly riveted?

A. They were singly riveted.

Q. Have you ever seen such a tank for gasoline double riveted at the bottom seam?

A. Never; I have never seen a gasoline tank or water tank double riveted.

Q. What is the purpose of double riveting?

A. Double riveting is applied where extreme pressure are going to be used on a tank.

Q. Is double riveting for strength or tightness?

A. Double riveting is put in to get more shearing, rivet shearing surface.

Q. Is that another way of saying it is for strength?

A. It is for strength, yes.

Q. In your opinion was any additional strength necessary for such tanks with such pressures?

A. There was no need for any additional strengthening.

Q. Could you tell whether the rivet holes were punched or drilled?

A. That I could not do; it doesn't matter. A rivet hole that is punched and then reamed is just as good as a drilled hole. We specify in punching holes that they be punched smaller than the diameter of the rivet and then reamed; also reduced to remove any distorted material in punching. Either a drilled or punched hole could be uneven, in pitch or in alignment.

Q. Can you tell anything about the way these rivets line up or don't line up, whether they were punched or drilled?

A. No. As I just stated, either a drilled or punched hole could be out of line.

Q. Considering the small pressures involved in these tanks, in your opinion does it make any difference whether the rivet holes were punched and reamed or drilled?

A. No, it doesn't make any difference in a tank of that kind.

Q. Now as to the size of the tanks, what can you say about the propriety of having tanks of that size?

A. For a vessel of her size a five hundred gallon tank—we will call it five hundred—is not too large in my estimation.

Q. You have already expressed the opinion, I believe, that they were amply strong for this use?

A. Yes, they were amply strong.

Q. Have you made any test of one of these tanks?

A. I have.

Q. Which tank was it?

A. Number 4.

Q. When did you make it?

A. I made it the later part of May.

Q. Where was the tank when you tested it?

A. The tank was removed from the compartment by a derrick.

Q. Were you there?

A. I was there.

Q. Was it done under your supervision?

A. It was.

Q. Where was it placed?

A. The tank was taken out and placed on a derrick barge.

Q. What did it rest on?

A. I had the tank set on two four by fours for the purpose of getting the bottom edge up above the deck of the barge so that the inspection could be made of the bottom while the test was being made.

Q. Did the tank stand upright?

A. Yes, on its own bottom without any bracing.

Q. Then what did you do?

A. I proceeded to put a water connection, hose connection, in the drain-off, which is in the bottom of the tank, or the bottom of the seat.—

Q. You mean at the place where the feed line came out of the tank?

A. Yes.

Q. What did you put there?

A. I put a hose connection there, screwed a hose connection into that bushing that was already there, and then in the filler hole at the top I inserted a pipe plug in the two-inch opening. I screwed a pipe plug into that and connected the hose from the city line pressure to the tank and proceeded to fill it with water.

Q. How did you fill it with water?

A. The tank was filled up to the very top; I had it filled so that the water was just even with the vent hole in the top. I watched that while the thing was being filled, to see that the tank was absolutely full.

Q. When you filled it with water, what did you do?

A. While this tank was full of water at that level I thoroughly examined the bottom edge, the side seams and underneath it, using a flashlight—by using a flashlight I could get around all sides of it. I also rapped the sides of the tank with a hammer to jar any possible corrosion loose; in other words, I tried my very best to make it leak, but it did not leak.

Q. Did you find any leaks?

A. I found only two leaks.

Q. Where were they?

A. One was in the cast iron bushing in the drain on the feed line.

Q. Where the feed line valve was?

A. Yes. And that crack was put in there when we screwed in the bushing.

Q. How do you know that?

A. Because as I screwed the thing in I heard it crack.

Q. Who was screwing it in?

A. My helper.

Q. Where were you?

A. I was standing right alongside of him, watching him to see exactly what he did, and I heard the thing crack when he tightened up on the fitting; and the other leak was in the plug that was applied to the filler hole in the upper end of the tank, and that was due to the rusty condition of the threads.

Q. Could you get a tight fitting in?

A. No, we couldn't without using some shellac, which we didn't have at the time. We didn't bother with it because we knew we could check that.

Q. Did you find any leaks in any seams or at any rivets anywhere?

A. There were no leaks whatsoever in any seam or any rivet in that part of that tank.

Q. Then what did you do after that?

A. After testing it with a normal supply or quantity of water in it, I screwed in a half-inch length—a ten-foot

length of half-inch pipe—screwed that into the vent hole in the very center of the top, upper end, and then filled this to the top with water.

Q. Did you find any leaks?

A. At this point there were still no leaks. I went over it the same as I did in the first place; I used a hammer and checked every seam and every rivet and there were still no leaks.

Q. About what pressure was there at the bottoms of these tanks with that ten-foot riser coming above the vent filled with water?

A. That ten-foot riser would give you eight and one-half pounds.

Q. At the bottoms of the tanks?

A. Yes.

Q. After that riser test, what did you do?

A. After that test I removed the riser and inserted a half-inch plug in place of it, so that there was no air in the tank whatsoever. The water was right about flush with the very outside tank, and in this hole I inserted a half-inch pipe plug and then I turned on the complete city pressure.

Q. Approximately what was that?

A. The city pressure out there is approximately 45 to 50 pounds.

Q. Did you find any leaks?

A. I went over the tank in the same manner as before and there were still no leaks. After that I got up on top of the tank and exerted considerable pressure with my heels, practically kicked the tank with both heels which gave the same effect as a hydraulic ram.

Q. And you jumped on top of the tank and—

A. I did more than jumped; as I came down I kicked with both heels.

Q. What effect, if any, did that have on the tank?

A. The effect was the same as a hydraulic ram.

Q. After that did you find any leaks?

A. I then examined the entire tank and I could still find no leaks, but one-half of the tank had been bulged due to that excessive pressure.

Q. Before you made that test was the concave shape of the bottom of the tank a fair curve or not?

A. Yes.

Q. After you jumped on the tank what did you find had happened to the bottom?

A. That half of the bottom of the tank was bulged out.

Q. Did you examine the rivets and seams thereafter to see if they leaked then?

A. I examined every part of that tank, including the seams and the rivets, and I could find absolutely no evidence of a leak in that tank anywhere.

Q. Excepting of course the two leaks that you have already mentioned?

A. Yes, which I already knew about before I even started.

Q. You say that the one near the feed line outlet was in the bushing?

A. That was a reducer bushing. You see, the hole in the tank had a two-inch fitting which was put in there when the tank was originally built, and that was reduced, I believe, to three-quarters. The hole was two inches but it had a three-quarter inch reducing bushing on it; it was made of cast iron.

Q. You said something about hearing that crack when it was being set up.

A. As we screwed the new fitting, or this hose connection into the bushing, that pipe threading is not tapered down, and if you exert enough pressure in turning these things up, you can split one of these cast iron bushings.

Q. Did you observe whether or not that is what happened?

A. That is exactly what happened; because when they get old, as that one was—they are made of cast iron, and

we know and knew at that time, that we had to set the thing up much tighter than we ordinarily would have.

Q. For what reason?

A. Because of the improper threads that were in there due to rust.

Q. What do you mean by "improper" threads"?

A. The threads having been used for some time, the threads were naturally pitted and rusted, and they wouldn't make as perfect a connection as a new fitting.

Q. Is that the same condition that you found at the filler line opening in the tank?

A. Yes. That was exposed ever since the fire, and that was even in worse shape before the—

Q. Have you examined this valve on exhibit 2?

A. Yes, I have seen that several times.

Q. Will you tell us whether or not that valve is a proper type of valve for such an installation?

A. That is a perfectly proper type of valve; it is a standard Globe valve.

Q. Can you tell whether or not that valve is tight now?

A. That valve is tight at the present time.

Q. How do you tell?

A. By trying to suck through it.

Q. Have you done that?

A. I have.

Q. Have you been able to suck anything through it?

A. No, sir.

Q. What does that indicate to you?

A. It indicates that the plug and the seat in here (indicating) are still in usable condition.

Q. Tight even today?

A. Tight even today.

Q. Now there has been some suggestion of an expansion of the union on this fitting; are you able to detect any expansion of that union?

A. That is pretty hard to say. I could put a pair of calipers on it, but even at that it would not be correct,

because this fitting has been cut; it shows teeth marks of a Stilson wrench on it, which would naturally increase the diameter and it would have a tendency to swell the outside.

Q. Now assume that it has been expanded; can you tell whether or not it was tight?

A. I could tell if I could get it apart; you can tell whether the thread is tight, whether the pipe is all the way up to the shoulder on the inside.

Q. Now there are two parts to that, a male part and a female part; is that correct?

A. That is right. This is the male end here and this is the female end here. You see, there is no shoulder on the inside of that at all. You can see in this end of it here, the female end; you can see the threads on the inside of the fitting, indicating that all of the threads were not used up in setting up the pipe.

Q. What does that indicate?

A. It is possible to set this thing up further and naturally make it tight. The same thing applies to this one on the male end, but not as much as on this other one.

Q. Are these tapered threads or not?

A. All pipe threads are tapered slightly; it is done for the purpose of making a tight joint; as you screw the thing in its naturally increases in diameter and forces the pipe against the other threads.

Q. Does that have a widening effect?

A. Yes, and that could in time have a tendency to spread these (indicating).

Q. What is indicated to you by the fact that the male end is not all the way up to the shoulder of the female?

A. That the pipe was tight; that the joint was tight, that all above the threads was entirely used up.

Q. In your opinion was that a tight joint on the Seminole before the fire?

A. A perfectly tight joint, if it was made up in that manner; if it was made up in that manner, naturally it was tight.

Q. You have seen Libelant's Exhibit 11, these two valves, which we call drain valves or draw-off valves—you have seen these and examined them, have you not?

A. Yes, sir.

Q. Do you understand that there was a line from the feed manifold that led athwartships and ended up in these two valves which were sometimes used for drawing off gasoline from tanks into a can?

A. Yes; that is what I gathered from testimony given here.

Q. From your experience with vessels in these waters, will you tell me whether or not that is a proper condition on such a vessel as this?

A. It is very common; it is a very common practice on boats of her type; it is quite proper; it is a necessary part of the vessel.

Q. Are there any reasons why that fitting should be in the engine-room rather than some place else?

A. Well, the drawing off of any quantity of gasoline should be naturally under the supervision of the engineer, who is the man who is experienced in the handling of gasoline, and it should be his duty to know how much gasoline has been removed from his main tanks or from any other tanks on the vessel, so that it would naturally be a prudent place to put it in the engineroom where he had supervision of it. Also, in that type of vessel it was necessary to prime your motor with raw gasoline, and the best place to get that raw gasoline was from some place in the engineroom

Q. Are there other considerations besides the fire hazard that must be taken into account in determining such matters?

A. Certainly, yes.

Q. Tell us about that; what are they?

A. As I explained, this motor had to be primed to start: even when it was hot it had to be primed.

Mr. Matteson:

If the Court please, I object to this because this witness, as I understand it, has never had any experience with the engines of the Seminole, in attempting to operate them. He cannot possibly speak of his own knowledge with respect to them; he is only drawing some conclusions here, and I move to strike them out.

The Court:

Well, it is an assumption on his part. I think that the testimony ought to be withheld until he is qualified.

(By Mr. Underwood):

Q. On what, Mr. Munroe, do you base your thought that these engines had to be primed even when hot?

A. Because of the experience that I have had with—not necessarily a Winton motor—but with motors of that same period and—

Q. Same size and type, you mean?

A. Not necessarily the same horsepower, but motors of nearly the same size but of different makes, 20th Century and the old Buffalo—

Q. At that time was it customary to have chokes on motors?

A. When that motor was built of that size they didn't use a choke.

Q. Do they use chokes on motors of that size today?

A. No.

Q. In your opinion, from your experience, was it necessary to prime that motor to start it even when it was hot?

Mr. Matteson:

I object to that, if your Honor please; I don't think the witness is qualified to speak with respect to the motors of the Seminole under the circumstances.

The Court:

I think this goes to the quality of his testimony. You may cross examine on this.

A. Yes.

(By Mr. Underwood):

Q. Will you tell us whether or not in your opinion the possibility of having to prime these motors to start them, even when they are hot, is something that should be properly considered in determining whether these draw-off valves for gasoline should be in the engineroom or somewhere else?

A. In order to prime the motors, I believe it took in the vicinity of a pint—I think that was the testimony that was given, or a quart to prime both motors, and that is considerable gas to be used, and naturally it took a quart priming can that you had about that size, which has been described in the testimony—it only held about one quart or less, and naturally it had to be refilled as soon as the motors were primed.

Q. Why is it necessary to have a ready supply of gasoline for priming motors; what are the other considerations that touch upon it besides fire hazards?

A. Other hazards due to the failure of the motor, stalling of the motor, where the motor might have to be started in a hurry in approaching a dock or going through or under a bridge, or approaching a bridge; you have your hazards on the external part of the vessel; you might strike a dock or run into a shoal or go on a lee shore, and might have to start your motor hurriedly, and naturally a motor will start much quicker when primed than it would start ordinarily.

The Court:

Mr. Munroe, you spoke of what the testimony was. Did you hear all of the testimony or did you read the testimony?

The Witness:
I heard all of the technical testimony.

The Court:
If you take any testimony as the basis for any of your testimony, I wish you would refer to it. If you take any part of the testimony as a basis for your answers, I wish you would state just what it is.

The Witness:
I will if I can remember it; if I can remember who said it.

The Court:
You don't have to state who said it; just state the factors you take into consideration as a basis for any expert opinion that you may render. I am not asking you to do that now, but I am merely making this observation for your guidance in the future.

The Witness:
Very well.

(By Mr. Underwood):
Q. All things considered, can you tell us whether or not in your opinion it was proper to have such an arrangement as this in the Seminole?
A. If there was going to be any free gas used in the boat, it was better to have it right where it could be easily obtained and under the supervision of an experienced man.
Q. How many of these valves had to be opened in order to draw off gasoline?
A. Two besides the ones on the tank.
Q. In such installation as you have seen before, have you seen one or two?
A. I have never seen but one.

Q. Have you examined these two valves that form Exhibit 11?

A. Yes, I have looked at them.

Q. In your opinion are they proper valves for such use?

A. They are perfectly good Globe valves; it is Crane 150; that is the water or steam pressure it can be used for.

Q. Is there any similar marking on the other valve?

A. On the other valve is 125; that is the maximum amount of pressure for steam.

Q. Do I understand that these figures, 150 and 125 indicate the pressures that these valves are supposed to withstand under normal conditions of steam?

A. That is correct, of steam.

Q. What pressure would they be subjected to when closed on the Seminole, assuming that the tanks were full?

A. Not over two and one-half pounds.

Q. I haven't asked you to calculate the margin of safety, and I won't. What type of valves are these; let's take first Crane 150?

A. This is a metal to metal Globe valve.

Q. Is that what is called a ground-seat valve?

A. This is a ground-seat valve on this. No, I will take that back. I have examined it now. That is a composition seat valve, the Crane 150.

Q. The 150 valve is a composition seat valve?

A. That is correct.

Q. Have you been able to tell from your examination what kind of composition the seat is made of?

A. No.

Q. Do you remember opening that valve with Captain Patten?

A. Yes.

Q. Did you observe the residue of the stuff that came out?

A. I did, but I am not a chemist and I couldn't tell what the ingredients was that that stuff was made of, that that seat was made of.

Q. In your opinion is a composition seat valve a proper valve for a gasoline line?

A. Providing the composition is proper—providing the composition is a proper one for resisting gasoline.

Q. Is there such a composition seat?

A. There is.

Q. Is it made by a reputable maker who makes them?

A. It is made by Crane and also by Jenkins.

Q. Is it used for gasoline customarily?

A. This is the valve that they recommend for the use of gasoline.

Q. There is a special seat made for gasoline?

A. Yes, there is a special composition seat made for handling gasoline?

Q. We have had some discussion as to the relative merits of metal ground seat and composition seat valves; what is your opinion?

A. Either one in my opinion is good. I think that the composition seat, if the proper composition is used, makes about as tight a joint as it is possible to use. I notice that Crane always uses the composition seat in his heavier pressure valve. This one is marked 150, and it is a composition valve. The ground seat is plenty good enough for the low pressure. It will take care of any sand or grit that gets in there. It would easily pulverize most anything that gets in there except possibly a diamond; and will naturally break that grit down until it will make a perfect seat instead of moving up in the joint, in the compound of the composition seat.

Q. In your opinion, were these valves proper valves?

A. They were perfectly proper.

Q. Assuming, Mr. Munroe, that the line which led from the feed manifold to these drain valves led back athwartships from the starboard end of the manifold, through the

sides of a tank which was situated above the square opening in the forward engineroom bulkhead, and was supported by these sides, in your opinion was that adequate support for such a line made up as this line was?

A. I would say that it was perfectly adequate; it was a three-quarter inch line, and the spacing of these supports was quite sufficiently close.

The Court:

We will take a five minute recess.

(Recess.)

(By Mr. Underwood):

Q. Now, Mr. Munroe, before the recess we were talking about supports for the drain line that led to these valves. I want to get it clear. In your opinion was that support from the sides of the tank adequate suport for a line of that size and length to insure it against leakage due to vibration?

A. Yes. The supports were plenty close enough together. Of course, I couldn't tell what the size of the hole was through there; I assume that it was a neat fit.

Q. I will ask you to assume that it was, Mr. Munroe.

A. All right.

Q. Something has been said about the union between these two drain valves that form Exhibit 11, and I think there has been some testimony that it was installed the wrong way. What have you to say about that?

A. I really can't say that there is any wrong way; the customary manner of setting up a union of this type is to make it up against the line; in other words, as the nut is turned it is turned to the right to set the nut up to the thread behind it.

Q. Against the line that is already in place?

A. Yes.

Q. And that has a tendency to tighten up the joints that are already in the line to which it is being added?

A. That are already in the line, and that is the way it is made up; the metal end of this thing is on the main line.

Q. Assuming that there is a column of gasoline in the pipe, does it make any difference which way the union is made up, whether in one direction or the other?

A. After it is tight the pressure on both sides is equal, so that it wouldn't make any difference if the nut is set up tight.

Q. Have you examined the plug of the ground-seat valve, the valve marked Crane 125?

A. Yes, I have examined this.

Q. In your opinion is that a proper plug?

A. This is a proper type of plug and seat.

Q. Some attention has been called to the condition of the contact rim or surface of the plug; what have you to say about that?

A. There is a small flaw in this plug; whether it was present prior to the fire or not cannot be determined; that could easily have occurred due to corrosion since the fire, due to the heat, and even if it was there prior to the fire it is on the upper end of the plug, above where the plug seats.

Q. Do I understand that you say that the crack in the contact surface is above the point where the plug comes in contact with the seat?

A. That is correct.

Q. That being so, could there be any leak or is it physically possible to have had any leak in that flaw?

A. No possibility.

Q. Have you tested that valve to see whether it is tight now?

A. No, I haven't. It could easily be loose now due to the extreme temperature that was applied to it, the heat of the fire warping the metal.

Q. Some comment has been made about the angle between the plug and the seat of that valve. What is your opinion as to that?

A. Well, this is quite a sharp angle. I would say offhand, without measuring it, that it is sharper than a 45-degree angle. This is not a straight faced angle; it is rounded. You can get anywheres from 45 to more of an angle.

Q. I think the suggestion has been made that the needle type valve is the preferable type. What is your opinion as to that?

A. A needle type valve is not a proper valve for a cut-off valve, due to its increased area of contact between the plug and the seat, there being more chance of grit or foreign matter lodging in there and keeping the valve from seating properly. A needle type valve is used only for throttling purposes, where you want to graduate the flow of fluid through the valve.

Q. In your opinion is the angle on that valve a proper angle for this use?

A. It is quite a sufficient angle.

Q. Assuming that there was a glass gauge in the engineroom and that it ran from a T-connection in a manifold which was packed with asbestos packing, will you tell us whether or not that is a proper fitting for an engineroom of that type of boat?

Mr. Botts:

I object on the ground that there is no evidence that there was any asbestos packing.

The Court:

I don't think so. Does the evidence establish that?

Mr. Underwood:

My recollection is that the witness Schlappi so testified.

The Court:

I will overrule the objection and let the assumption remain in, and if the assumption is not well-founded, of course the opinion goes out.

Mr. Underwood:

Does Mr. Botts have any contrary recollection?

Mr. Botts:

I think he said it was wicking.

A. The use of a glass type gauge in such an installation is quite proper; it is the only correct manner of measuring his fuel consumption or the fuel remaining in his tanks. A gauge of that type is used on all steam boilers where greater pressures are used, and it is in common use on a great many vessels, even in gasoline today. On several boats that I have been on I have seen them in use, and I have installed them myself. There is one boat here in town right now that has, I believe, four sight gauges in her fuel line, right in her engineroom.

Q. Some question has been raised as to the accuracy of my recollection as to the nature of the packing in the fitting, so I will ask you the same question again, and ask you not to assume anything about the packing, and will ask you whether or not such a device as a glass gauge is a proper device to have in an engineroom of a vessel of this type?

A. A glass gauge is perfectly proper.

Q. I believe you have already given your reasons in an answer to a previous question?

A. Yes.

Q. Is wicking a proper type of packing?

A. That depends on what you are speaking about. If you are speaking about cotton wicking, that is one thing. Wicking is made up in several forms. There is asbestos

wicking, cotton wicking and graphite wicking; also flax wicking. Wicking is anything that is made up with fibre or threads.

Q. I take it that your opinion is that some wicking is all right and some wicking is not?

A. That is correct.

Q. What is the particular hazard, if there is one, of a glass gauge for gasoline?

A. The only hazard of a glass gauge is that it is easier to break, but where this particular gauge was installed I can't say, because there is no indication as to where it was. If it was up against the wall in back of a panel and protected on either side by rods or strips of wood or anything which would prevent the accidental striking of it by a wrench or anything in the engineroom, either by a human element or something swinging—a gauge of that type is usually installed with a cut-off valve at both top and bottom.

Q. Do you know whether this one was?

A. This one had a cut-off valve at the bottom I am sure, because I found a part of the lower end of it; I don't know what was on the upper end.

Q. You have not seen the upper end?

A. No. That is a standard valve manufactured for that sole purpose.

Q. In practice is gasoline ordinarily in the gauge?

A. No. You open your valve and allow a column of fluid to rise in your tube, and you measure it, and then after you are through with that you can drain it back into the line and remove all gasoline or fluid from your gauge.

Q. In your opinion is it necessary and proper equipment to have cut-off valves in gasoline feed lines near the carburetors?

A. That depends a great deal on the head in the line; it is not absolutely necessary.

Q. What is the ordinary purpose of having cut-off valves in a gas line near the carburetor?

A. Only when working on the carburetor and disconnecting the gasoline from the carburetor, to disconnect the gasoline from the carburetor.

Q. Now in this installation I will ask you to assume that there were cut-off valves in the gas line at a point below the manifold and at a point below the strainers where the feed lines led from the manifold down toward the bilge; that would be very close to the forward bulkhead of the engine room—assuming that there were shut-off valves in each gasoline line so situated, in your opinion was that sufficient for that line?

A. It was.

Q. Assuming that these valves were shut, would there be any head of gasoline on the carburetor?

A. There would be no head whatsoever.

Q. Why is that?

A. If the valves were tight and allowed no pressure to come through from the tank, in order for fluid to run out of the pipe below the valve, it would be necessary for air to rise in the pipe, and in this particular case the fuel lines ran down under the floor and floor timbers and then came up again to the carburetors. So that the rise of pressure on that line from the cut-off valve—which I assume the position of—was very low.

Q. Now is there any common experiment by which you can illustrate your testimony that there would be no head of gasoline on the carburetor with the valve shut tight?

A. Yes. You can take an ordinary garden hose or tube, or anything of that nature, and submerge it in water, or in any fluid, and put your thumb over the upper end of it and nothing will drop out of it except one or two drops at the lower end, and the smaller the tube or pipe the less chance of that.

Q. Did you find any drip pans under the carburetors?

A. No, sir, there were not.

Q. In your opinion were they necessary on an installation of this type?

A. They were unnecessary in a carburetor of that type; the carburetor wasn't chocked; it had no choke on it.

Q. Before we go any further, suppose you explain to us the function of a choke in a carburetor that is—

A. The purpose of a choke in a carburetor is to close off the air intake considerably and force or suck more raw gas through the jet of the carburetor; in other words, it breaks the flow through the tube rather than through the air intake and sucks raw gas up into the manifold.

Q. Where you have a carburetor with a choke, and you use the choke, Mr. Munroe, will you tell us whether or not it increases the flow of gas into the carburetor?

A. Yes, because you pick up a heavier flow of raw gas, and that hangs on the side of the manifold, the upright side of the manifold, and afterwards that will fall down and run back down the manifold into the outlet pipe of the carburetor.

Q. Is there any distinction between the two types of carburetors, those with chokes and those without chokes, as to the nature of—

A. Yes, there is.

Q. What is that?

A. Well, in a carburetor that has no choke you never get raw gas into the manifold.

Q. What is your conclusion from that as to the need for a drip pan?

A. There is no heavy fluid to run back and flood the carburetor. Even if there was a drip pan under there it only holds a certain amount, and when it is full it runs over and goes into the bilge.

Q. I believe you stated that these carburetors on the Seminole was of the type that didn't have a choke on them; is that correct?

A. That is correct.

Q. Now, there is some evidence in this case of a drip pan arrangement, that is, an attachment back of the in-

take of the carburetor to drain any dripping back into the carburetor or into the cylinders of the motor; are you familiar with such a thing?

A. There is such a drip pan on the market, and I have used them.

Q. How recent a development is that?

A. The last five or six years only.

Q. Is it in common use?

A. It is not in common use now. It is not very satisfactory, because unless you open the valve in your suction line to allow the gas to be sucked back into the manifold—it would only work the time you leave that open after the gas is out, and it allows too much air to go through the carburetor and it causes a poor mixture in your motor.

Q. Does it work when the motors are not in operation?

A. No, it doesn't.

Q. Were there backfire arrestors on the motors of the Seminole?

A. There were?

Q. Did you examine them?

A. I did.

Q. In your opinion were they proper?

A. Quite proper. Of course they are not entirely there; part of them has been destroyed, but what was left of them indicates that they were quite satisfactory.

Q. Of course they serve no purpose when the motors are not running, do they?

A. No, sir; they serve no purpose when the motors are not running.

Q. Now, Mr. Munroe, the feed line from the tanks to the carburetors of the Seminole was made up of brass pipe and fittings, as I think you observed. In your opinion is that the proper material and type of material to use for an installation of this kind?

A. That is perfectly satisfactory material to put on an installation of this size.

Q. Does copper tubing in your opinion have any superior advantages?

A. No; it has no superior advantages; it has only the advantage of being quicker to install, which in modern days prevents labor expense.

Q. In your opinion where copper tubing has been used, what has been the actuating reason.

A. Simplicity of construction is the principal reason and the saving of labor costs.

Q. Is copper tubing cheaper?

A. Considerably cheaper.

Q. In material as well as labor?

A. In material as well as labor. Of course it does reduce the number of joints, and that is what cuts down the labor charge.

Q. Is it possible to make a satisfactory and a tight installation with brass tubing and fittings such as was used on the Seminole?

A. It is perfectly possible to make a tight fitting in a brass pipe, to make a tight joint in a brass pipe.

Q. How does that compare with copper tubing as to strength and stability?

A. Brass pipe is really stronger; it has less chance of being crushed by someone striking it or by being pinched under a floor beam. You are apt to get a hole in copper tubing, and copper tubing is quite a little softer, and it is more subject to wear and chafing.

Q. In your opinion is either one more subject to injury from vibration than the other?

A. No; neither one. Either copper tubing or brass pipe can be distorted or broken by vibration. Copper tubing is softer, and of course has to set up a different vibration to that of a harder substance, and naturally the difference in size of the harder substance changes the vibration—

Q. Considering for the moment solely the question of vibration, in your opinion was the gasoline feed line

system on the Seminole a proper installation, properly protected against vibration?

A. Where I could see it, where it still remains, I would say that it was.

Q. In your opinion when does the effect of vibration show up?

A. During operation of the boat.

Q. Assuming that the Seminole had been laid up for 60 days when this fire occurred, and that she didn't show any leaks up to the time she was laid up—would you expect to find any effect of vibration coming into evidence while she was laid up?

A. There would be no effect of vibration while she was laid up, and if there were no leaks at the time she was laid up there, then certainly no leaks would start from vibration afterwards.

Q. In your experience is it customary to solder joints in brass pipes for gasoline feed lines?

A. I would never recommend it.

Q. Why not?

A. There comes times when a line has to be taken down. I will admit that a soldered joint is tighter; maybe it is about as tight as any as you could possibly put in there, but in order to disconnect these threads it is necessary to use a blow torch on the joints, and one doesn't want to use a blow torch on a gasoline line.

Q. What is the customary method in your experience of making up joints in such a feed line?

A. You mean what would be applied?

Q. What, if anything, do you apply?

A. I would apply principally orange shellac.

Q. Do you always use that?

A. Well, under some conditions we don't, depending a great deal on the pressures; sometimes it is necessary to use litharge and glycerine mixed with shellac.

Q. Will you tell us whether or not some such preparation is commonly used in making up such joints?

A. All gasoline joints that I have ever seen shellac has been used on them.

Q. Can you tell from your examination of the joints in this line what, if anything, was used?

A. No, I cannot tell from these exhibits here; these exhibits have been burned and the shellac was destroyed under fire.

Q. Can you tell whether or not anything was used?

A. No, I couldn't tell whether anything was used.

Q. Assuming that the proper compound of shellac and whatever substance you have in mind was used in the making up of these joints, is its absence from the joins today any evidence that it was not used?

A. No.

Q. What would happen to it in a fire?

A. It would burn up; it would be burned up and destroyed.

Q. In your opinion was there any need for coils in this feed line?

A. No, there was no necessity for a complete coil in this feed line.

Q. What kind of feed lines do you put coils in sometimes?

A. Only in copper tubing. In this line, wherever there was an angle it acted the same as a coil; a coil is put in there to relieve the strain on the connection.

Q. In view of the distance which I take it you have observed from the feed manifold to the carburetor, would you anticipate any effect of vibration on the feed line?

A. No; they seemed to be properly installed under the engineroom floor.

Q. Now, as to the ventilation of the tank compartment, we will assume that it was ventilated by only the holes in the top of the bulkhead through which the filler line ran and the holes at the bottom of the bulkhead thhrough which the feed line ran, and the spaces which you have observed under the tank compartment, and the

spaces between the edges of the pans and the bulkhead —you have observed these spaces?

A. I have.

Q. In your opinion was that adequate ventilation for this compartment?

A. It was. There was a chance for complete circulation of air around these tanks, especially the space between the pan and the bulkhead, which was a matter of about two inches; you could stick your hand up through there, and there was quite sufficient space below the pan to the floor.

Q. I will ask you to assume that the engineroom was ventilated by two cowl ventilators, which I think you have seen on the boat—is that right?

A. I have.

Q. And that they didn't extend into the bilges but only a short distance below the deckhead, also by a skylight and by an engineroom hatch, which I think you have also seen; is that right?

A. I have seen the opening.

Q. You have seen the openings in the steel top of the engineroom, have you?

A. I have.

Q. Also by two windows, one on the starboard side leading into the alleyway and one on the port side. I will ask you to say whether or not ventilation from these sources was adequate ventilation for an engineroom of the size of that on the Seminole, containing the gasoline installation which he had?

A. These openings would supply a great deal of air to that engineroom, in fact, a great deal more, due to those windows, than in the average engineroom or engineroom compartment of any other boat. I would say that there was quite a sufficient circulation of air. Any wind passing in the windows, although the floor was below the ceiling of the windows, it would have a tendency to curl and go

down around the floor and circulate across the floor in through the bilges.

Q. How does that ventilation compare with the ventilation on other gasoline propelled vessels?

A. This is a great deal more ventilation than on the average boat. Of course boats of her type, where you have large square ports opening directly to the outside of the vessel, you have considerably more ventilation than you will find in the average engine space or compartment of any boats.

Q. Now from your experience, Mr. Munroe, will you tell us whether knife switches are proper for use on a switchboard in an engineroom on a vessel like the Seminole?

A. Knife switches are absolutely correct; I have never seen any other kind of switch used.

Q. Is any other type of switch in common use?

A. No; every switch today, whether it is enclosed or open, is a knife switch.

Q. What is the customary type of switch used on gasoline propelled vessels?

A. Knife switches.

Q. Any boxes around them?

A. No box around them. You will find today, which is a very modern improvement, so-called improvement,—you will find what is known as a dead-throw switch panel.

Q. What is the purpose of that?

A. Merely to protect the engineer or man in the engineroom from coming into contact with a live switch or live contact which is perfectly open behind the panel.

Q. In your opinion do you get a spark from opening or closing a knife switch with an installation of 110 volts, or approximately?

A. In my experience I have never seen a spark occur on the closing of a knife-type switch; sometimes a very small spark occurs when it is opened.

Q. When you say "small spark", how big a spark do you mean?

A. Something that you would have to look for twice to see, unless you were looking directly at the contact.

Q. When that spark occurs on the opening of a knife switch how long does it last; what is your experience?

A. Only just a flash.

Q. Does it go anywhere; does it drop or rise or stay at the poles of the switch?

A. No, no; it only occurs between the blade of the switch and the pole.

Q. How about the location of the switchboard; it was in the engineroom, and I think you have seen the bolts—is that right?

A. Yes.

Q. The bolts that held it in place?

A. Yes. And from these bolts I would say that that was in the proper position in the engineroom.

Q. Assuming that it was where the bolts were in the center of the after engineroom bulkhead,—is that a proper location for the main switchboard with open switches?

A. That was as good a location as they could get in that boat. It was perfectly proper, no matter where it was.

Q. From your experience are switchboards customarily so located?

A. I have never seen a switchboard anywheres but in the engineroom; in fact, it has to be in the engineroom; for instance, you can't run out of your engineroom to open a closed switch when you are starting your generator.

Q. In laying up vessels of the gasoline propelled type, in your opinion is it customary down here to empty gasoline tanks?

A. On small vessels or open boats, where there is no necessity for gasoline to be present, they usually remove the gasoline, but not because it is a hazard so much, but from the fact, due to the small fuel line—in other words, gasoline leaves a sludge, which fills these gasoline lines,

so we remove the gasoline from them for that purpose. In the larger vessels that have a generator, and where batteries are left on the boat, in order to keep these batteries in condition it is necessary to run your generator.

Q. Is it the practice to leave the gasoline in the tanks of the larger vessels?

A. Yes, so that the man who looks after the generator and batteries can operate.

Q. What in your opinion is the proper thing to do in the laying up of a boat of this kind; is it proper or not to leave the gasoline in the tanks?

A. So long as the tanks don't leak and there is no leak in the line, there is no chance for gasoline to leak into the bilges, and a full tank of gas is much safer than an empty tank.

Q. Have you heard of or are you familiar with Lloyd's rules for the construction of yachts?

A. Yes, I am familiar with them.

Q. Have you ever used them in the construction or design of a vessel?

A. I have never used any of them in any of my construction, no.

Q. Is it customary in this locality to build vessels or keep vessels up to the requirements of Lloyd's rules?

A. It is not necessary in this locality to build or equip a vessel according to Lloyd's rules. They are applied primarily to vessels of the offshore type.

Q. You mean seagoing vessels?

A. Yes.

Q. Was the Seminole of that type?

A. No, she was not.

Q. Is it customary down here for inland vessels, not of the seagoing type, to live up to Lloyd's rules?

A. No, it is not.

Q. Have you any familiarity with the rules of the National Fire Prevention Association?

A. Yes, I am familiar with them.

Q. I show you this book, Libelants' Exhibit 25; is that what you are talking about?

A. Yes, that is the book that I am familiar with.

Q. Also Libelants' Exhibit 97, which contains as an appendix Libelants' Exhibit 25?

A. I have seen these and read them.

Q. Is it customary for vessels down here around Miami or in Florida waters in your experience to live up to the requirements of these rules?

A. No, it is not customary to live up to these rules.

Mr. Botts:

I object to that and move to strike the answer.

Mr. Matteson:

I join in the objection, if your Honor please; I understand that it is a well established principle that no custom can justify a negligent practice.

(By Mr. Underwood):

Q. Do people generally use these rules as a standard by which to equip their vessels?

Mr. Matteson:

If your Honor please, that doesn't seem to be the question here. It is a question of whether competent people dealing with such problems recognized these as standards. Whether this gentleman was familiar with the rules doesn't seem to make any difference.

The Court:

I understand that the witness is testifying from the standpoint of an expert. I think it is proper for him to answer the question as to whether or not these rules are observed in the architectural construction of vessels in this community as a standard of good construction. I

think that is the intent of the question, so I will overrule the objection.

Mr. Underwood:
Read the question.

(Thereupon the preceding question was read by the Reporter as above recorded.)

A. I don't know of these rules being in the hands of any of the builders around here, with the exception of the large yards.

Q. Do you regard them as the proper standards for vessels of this type?

A. I consider them as a standard of practice where it will apply best in the case that I am using.

Q. What do you use as your standard—

Mr. Botts:
I object to that as being immaterial.

The Court:
I will sustain that objection.

(By Mr. Underwood):

Q. Mr. Munroe, I show you Libelants' Exhibit 24, which is entitled: "E. D. Wright, Bureau For The Prevention of Explosion and Fire on Motor Boats", and so forth. Did you ever hear of these rules before I asked you about them in connection with this case?

A. No, sir. I had never seen them prior to the time that you called my attention to them.

Q. Are they in your judgment proper standards by which to test a gasoline propelled vessel?

A. I don't say that they are proper standards; this is only one man's opinion. My opinion is—

Q. Are these rules commonly used down here?

A. I have never seen them before, so I don't know.

Q. Do you recall what was the nature of the construction beneath the drain pans that were under the gasoline tanks?

A. You mean the supports?

Q. No. Was there any wood in there?

A. There was a wood cushion or something of that nature under these pans.

Q. Have you examined that?

A. I have.

Q. Was it destroyed by the fire?

A. It has been slightly burned but wasn't entirely consumed by the fire.

Q. How about the members that form the cushion on which the tanks sat; were they affected by the fire?

A. These cushions, or four by four frames that were under the pans on which the tanks sat are as new or as in good condition as they were when installed; there hasn't been any fire touching them, there has been no heat applied to them, and when I first opened that compartment there was still red lead paint on those members.

Q. Did you draw from that condition any connection as to the presence of fire or the existence of fire under the gasoline tanks?

A. I would draw from that conclusion that the fire in the engineroom and under the tanks wasn't of any severe nature, because none of these things have been burned to any extent. The floor timbers under the engineroom floor and motor bearers are not badly charred.

Q. By "bearers" you mean these athwartships wooden beams?

A. The four by four pieces on which the main motors sat are not badly charred, to show any indication of there having been a severe fire in the bilge or in the engineroom.

Q. If there were no gasoline vapors in any quantity

in the bilge of this boat would you expect or would you not expect a severe fire at this place?

A. I would certainly expect it. I have seen it in other cases. I know of one case in which the entire bilge of the boat was practically consumed. The frames and the inside of the inside planking and the floor timbers under the floor, above the floor, and way up in the sides of the vessel, between the ceiling and the planking, was badly charred, yet there were very few places above the floor where it showed any signs of fire, so that in going below in her, before opening the floor boards, you never would have suspected that she had been afire.

Q. From the condition of these members are you able to form an opinion as to whether or not there was any severe fire in the bilge of that boat?

Mr. Botts:

I think it is improper to ask a person as an expert a hypothetical question upon subjects as to which there has been no direct testimony.

The Court:

You mean direct testimony to the contrary?

Mr. Botts:

There has been no direct testimony as to this fire, therefore my understanding is that a hypothetical question on that subject is not proper.

The Court:

Read the question.

(Thereupon the preceding question was read by the Reporter as above recorded.)

The Court:

The objection is overruled.

A. From the condition of them I would say that there had never been any severe fire in the bilge of the engine-room or under the tank compartment of that boat.

Q. From your examination of the remains of the Seminole did you observe any evidence of a violent explosion?

A. That is rather hard to determine, because the fire had warped the plates, the bulkheads, and the hatch above the engineroom has been removed; so I really cannot see any place or evidence of an explosion. There are places where the plates have buckled. That could have been done during the fire itself, considering the extreme heat.

Q. Now, Mr. Monroe, bearing in mind all the details that we have referred to about the Seminole, will you tell us whether or not in your opinion in her construction and equipment she complied with the standards for such things accepted and employed by reasonable, prudent men in this locality for similar vessels?

A. From the examination I have made of that vessel, she seems to have complied with all of the necessary safety factors. The installation was proper, and I can find no place in her where there was any flaw or any chance for the leaking of gasoline. The pipe lines are tight and made up properly. Of course there was very little we could see of them. Certainly the tanks were proper. The trays that they sat in were proper and the ventilation seemed to be proper in that boat.

Q. Now assuming that the Seminole had been laid up for two months under a shed at Pilkington's Boatyard, and that on June 24, 1935, when Abel went over and into the engineroom there was no odor of gasoline, was there in your opinion, any reason why he should hesitate to close from three to five open knife switches on the switchboard to get lights?

A. There was no reason why he should not close these switches, if he smelt no odor of gasoline, and he struck a match, as I believe the testimony has stated—Mr. Thomas, I believe mentioned that—had there been any gas in her

that match would have ignited it before the closing of any switches. The boat was laid up only two months prior to that in good condition; she wasn't in service—

Mr. Matteson:
It strikes me that the witness is summarizing the testimony here.

The Court:
I think so.

Mr. Underwood:
He is just giving his assumption, your Hoonr.

The Court:
Mr. Witness, if there are other facts developed in the testimony, on which you base a part of your answer, you should state the facts on which you make the answer.

Mr. Underwood:
I think he was doing precisely that, your Honor.

Mr. Matteson:
Do I understand that the question is to be answered over again?

The Court:
Yes, I think he should answer the question again. Strike that answer.

Mr. Underwood:
Read the question.

(Thereupon the preceding question was read by the Reporter as above recorded.)

The Court:
Now answer that question.

A. The answer there is "no".

Q. Why not?

A. Smelling no odor of gasoline, it is perfectly logical that—

Mr. Botts:

Just a minute; he is arguing again, Judge.

The Court:

Let him continue the answer.

A. Well, I personally would not hesitate to close them.

Q. Why wouldn't you hesitate to close them?

A. Because I smelled no odor of gasoline, and knowing that there isn't much spark made by the closing of a switch, or any spark at all by the closing of a switch, there would be nothing to ignite any gas fumes.

The Court:

We will recess now until two o'clock.

(Recess taken to two o'clock, P. M. October 10, 1939—the same day.)

2:00 o'clock, P. M., October 10, 1939.

Afternoon Session.

Mr. Underwood:

Just for the purpose of the record, I suggest that it be recorded that on Friday last the Court, accompanied by counsel for the three parties, who in turn were supported by experts, visited the wreck of the Seminole at Nutta's Yacht Basin and made a general examination. Is that satisfactory and adequate?

Mr. Matteson:

Yes, as far as it goes.

Mr. Underwood:

I don't know whether you want anything further or not.

Mr. Matteson:

I would like it also to appear on the record that it was my understanding that the arrangement which we entered into last March for this examination, was that the boat would be in the same condition when we went there in October as it was at the time we adjourned Court in May. It appears that there was a great deal done in the interim. Since the last session at least one of the tanks was taken out of the boat. I don't know what was done with the others, and tests were made not in my presence, and I want to register on the record my formal objection to that procedure.

Mr. Underwood:

Mr. Matteson expressed that view in a letter which he wrote to me during the summer sometime, and I examined the record to see if there had been an agreement as to that. I found no express agreement as to that. I will say that all that was done was to remove one tank, which the Court and counsel saw on Friday last. The purpose of that was to put the tank in a position where it could be more thoroughly and completely examined, particularly where the bottom of it could be examined, inasmuch as some issue has been raised as to the construction at the bottom of the tank and underneath the tank, and also the test that the witness now on the stand has testified to.

The Court:

Well, any statement that counsel wants to make on the record I think should be made. I do not see any action of the Court called for on it.

Mr. Underwood:

First, we all know that the tank was not permanently removed from the boat, but was put back on the boat, and was there on Friday last for such examination as anybody cared to make. Mr. Matteson used the expression "a good deal was done", and in that connection I will say that nothing was done except the removal of the tank and a test made thereon.

Mr. Botts:

I might state in that connection that my recollection was so clear that it was understood that the tank was not to be moved out of there, that we were to look at the tank and the tank would be removed in our presence, if necessary, but in the meantime the tank was to remain in its status,—my understanding was so clear as to that, that I seriously debated registering my protest to what had been done there by refusing to go to the boat, and I do feel that it would have been better if the boat had remained in its exact status, particularly in view of an issue having been raised here as to the condition of these tanks. I may have a misrecollection of the understanding, but I seriously doubt it. It certainly seems to me that it was hardly the thing to do for the other side to go out there months in advance and take that tank out and learn what the situation apparently was, learning the situation long in advance of any equal opportunity on the part of the fellow I represent. In other words, I felt it so strongly that I discussed or debated very seriously whether it would be proper for me to register my protest by refusing to participate in that examination.

Mr. Underwood:

The record will show and the Court will remember whether there was any such agreement.

Mr. Botts:

I checked it with the Court Reporter. The Court Reporter definitely remembers it, but he didn't take it down.

Mr. Underwood:

I don't know what the Court reporter remembers, but I think it is not unfair, in view of this comment to call attention to the fact that a person, impliedly in the employ of the widow of the deceased Abel but apparently actually in the employ of one or both of my adversaries here, took occasion, while the boat was still hot from the fire, to remove, without permission form anyone, and in effect steal certain equipment from the boat, which remained in possession of my adversaries in this case for many months, as the record shows, refusing to deliver it over to the original owner, the Seminole Boat Company. If there is any criticism in this case along that line, I think it does not lie in the morals of the gentlemen on the other side of the table.

Mr. Botts:

Had we not preserved them, this equipment would have never been before the Court. This equipment is now before the Court in just exactly the condition it was in.

Mr. Underwood:

I don't know whether Mr. Botts is testifying about the exact condition or not. I dispute that statement.

Mr. Botts:

Yes, I am; because they were in my possession from the day after the fire until they were delivered to the Court, and I say they are in the exact condition they were in, and I am willing to be sworn and so testify.

Mr. Matteson:

It appears from the testimony of the witness on the stand that there have been changes in the condition of the tank due to corrosion and the weather.

Mr. Underwood:
Since the fire?

Mr. Botts:
I would like to say now to counsel that I challenge him and I dare him to produce evidence to show that these articles were not in the exact condition when presented in Court as they were at the time we took possession of them. I dare him to try to prove otherwise.

Mr. Underwood:
Of course Mr. Botts has a complete advantage because his representative took them in his custody without our observing them or having any opportunity to determine in what condition they were. I can tell in some measure the difference between the way they now are and the way they were before the fire in April, or the last time anybody on our side of the case saw them.

The Court:
Let's proceed with the testimony. I do not understand that the Court is called upon to rule on anything in this connection at this time.

2929 Thereupon: WIRTH MONROE a witness in behalf of the Respondent Phipps, resumed the stand and was examined and testified further as follows:

Direct Examination (Cont'd.)

By Mr. Underwood:
Q. Mr. Monroe, there are two little details that I want to clear up. You mentioned a crack in the tank fitting which you heard when you connected up the hose for this test that you made in May. Did you examine the crack as well as hear it?

A. Yes, I examined it after hearing the break; I then examined it before I proceeded with my test, and it showed a bright small crack which wasn't there prior to the fitting of the hose connection, because I examined it prior to putting any connection into it.

Q. Will you describe for us the kind of leak that there was in that tank during the test?

A. In the first test, when the tank was just normally filled with water, there was just a slight leakage out of it, a matter of really no consequence; it was enough so that when we wiped it off with a rag it immediately came back again, and you would more or less call it a leakage, but under the high pressure that particular crack did show a stream projecting out from the—

Q. How big a stream?

A. About the size of a needle or common pin point; of course that was only when the extreme pressure was on it.

Q. How about the volume of leakage at the filling connection?

A. At the filler hole it was about the same; of course there wasn't any pressure created on that as there was on the lower one, but you could see it running down the edges of the tank, and it could be wiped off and kept from going all the way to the bottom.

Q. Was there any stream on that?

A. There was no stream at all on that.

Mr. Underwood:

You may cross examine.

Cross Examination.

By Mr. Matteson:

Q. Mr. Monroe, you have described yourself as a yacht designer.

A. Yes.

Q. What educational qualifications have you as a yacht designer?

A. You are speaking of education?

Q. Yes.

A. Well, my education has been along a practical line. My instructions were from my father and as the result of an apprenticeship with Mr. Herreshoff. I do not hold any college degree. It has been a school of practical experience.

Q. You never have studied marine architecture?

A. I have studied it at my own home but not in a school.

Q. What was your father's name?

A. Ralph M.

Q. Is he living now?

A. No, sir.

Q. How long ago did he die?

A. In 1933.

Q. Did he maintain a construction yard or repair yard or anything of that kind?

A. We maintained a small yard.

Q. What do you mean by a small yard?

A. Well, we couldn't handle vessels much over 40 feet in length, or drawing over four feet in draft.

Q. In that yard you say you handled vessels up to 40 feet?

A. We hauled them longer than that.

Q. You say you hauled them; do you mean that you maintained a marine railway there?

A. Yes, that is right.

Q. And the capacity of that marine railway was for vessels of yacht construction of about 40 feet in length?

A. I have hauled vessels on the marine railway up to 47 feet, but of low displacement.

Q. Where was that yard located?

A. On the east of Biscayne Boulevard in Coconut Grove.

Q. Is that yard still there?

A. It has been moved from the original location to another location.

Q. You have the same marine railway?

A. No, it is a new marine railway.

Q. The same size?

A. Yes.

Q. Do I understand you continued your father's business since that time?

A. I have.

Q. Are you engaged in the business of construction and repair at the present time?

A. I am.

Q. Is that with respect to the same class of vessels that you have described, up to 40 to 45 feet?

A. At that particular yard, yes, although I discontinued hauling large vessels, because I don't have the equipment now.

Q. What do you mean by "larger vessels"?

A. Up to 47 feet.

Q. How large vessels do you take care of there now?

A. I am only handling up to about 35 or 38 feet.

Q. Are these wooden vessels?

A. Yes, sir.

Q. Most of them are auxiliary sail vessels?

A. Not all of them; a majority of them are power, entirely power vessels.

Q. How many vessels did you handle there in the past year?

A. In the past year I don't recall—I haven't been at it—I haven't done any of that in the past year; I haven't been in contact with the yard as much as in the years previous. My business has taken me away from Miami.

Q. Is someone else operating the yard now?

A. I have a man there that takes care of it and I only permit him to haul the smaller vessels.

Q. Have you engaged in the manufacture of sailing vessels?

A. The design and construction of them.

Q. What type were they?

A. Auxiliary cruising vessels.

Q. Were some of them not auxiliary?

A. Small launches.

Q. I mean some of them are purely sailing vessels?

A. Some of them are purely sailing vessels, but the majority of the larger vessels were all auxiliaries.

Q. You only handle wooden vessels there, do you not?

A. You will find very few steel vessels in this vicinity.

Q. And none as small as that, I take it?

A. No.

Q. Now, take an average vessel of 40 feet, such as you handled there, with auxiliary equipment; what sort of a motor would she have; how large?

A. You mean the vessels that I would haul at that yard?

Q. Yes; vessels that you worked on there.

A. That depends on the type of boat, whether she is a straight cruising boat or whether she is an express cruiser.

Q. These vessels don't ordinarily have a separate engineroom, do they?

A. In some of them, yes.

Q. What sort of engineroom would they have, where would the engine be placed in an auxiliary vessel such as you handled down there?

A. Such as I handled there they wouldn't. The auxiliary wouldn't have a separate engineroom, no; I thought you were speaking of power vessels.

Q. Where, on these auxiliary types, would the engines be placed?

A. Well, in some they are placed amidships or slightly aft that.

Q. Or in the cockpit?

A. In other cases under the flush-deck aft.

Q. Usually in the cockpit?

A. In the smaller auxiliaries, yes.

Q. You say sometimes in a separate compartment?

A. Merely separated from the balance of the hull.

Q. What sort of a compartment would that be?

A. A compartment large enough to take the motor but not large enough for a man to walk around on; you couldn't do it on a 40-foot boat.

Q. In that type of vessel where would the gasoline tanks be placed?

A. Usually in the wings.

Q. By "wings" you mean either side of the motor?

A. Yes, or under the main deck.

Q. What sort of gasoline tanks do you use in vessels of that type?

A. Usually they are constructed of tin-lined copper or leaded steel, and occasionally tanks similar to these as in the Seminole, but not as large, of course.

Q. How large a tank capacity does the ordinary 40-ft. auxiliary cruiser have?

A. Fifty to sixty gallon, depending on what the boat is to be used for.

Q. In other words, that would be about a little over ten per cent. of capacity of one of the tanks of the Seminole, is that right?

A. Yes; that entirely depends on whether the boat is to be used for coastal work, inland navigation or whether she intends to go on long cruises where she is unable to get gasoline; in that case we put in larger tanks.

Q. The conditions with respect to piping and ventilation would be quite different in that 40-foot auxiliary-cruiser from what they were in the Seminole?

A. It would be considerably harder to ventilate such compartment, which is just as important—

Q. You recognize that ventilation of a gasoline boat is highly important, do you?

A. I consider it is one of the important factors in installations of the motors.

Q. May I ask your age, Mr. Munroe?

A. I am thirty-six; I will be thirty-seven next month.

Q. When you say that you worked with your father in his yard, will you tell us just what you did?

A. I did everything that I was asked to do, from carpenter work to rigging, piping and plumbing, and tinsmith work; anything that had to be done, I had to do it.

Q. How many employees did you have in that yard?

A. The maximum at times was six to eight men.

Q. You were one of them?

A. I was one of them, but I never got paid for it.

Q. You spoke of your connection with Mr. Herreshoff; will you tell us just what the nature of that was?

A. I was with Mr. Herreshoff as what would be termed an apprentice. Mr. Herreshoff and my father were very old friends, and Mr. Herreshoff lived with us here in Miami for a matter of eight or ten years.

Q. That is the winters?

A. He spent his winters here, and in the summer I used to spend a month to six weeks with him at the yard in Bristol, Rhode Island.

Q. What would you do up there?

A. I wasn't working or doing any of the actual labor, but I was with him on all of his inspection tours and conversed with him about the type of construction or whatever was being done in the yard; I was offered a job with him, with the yard, as a draftsman that could go from the drafting room to the actual construction. They had no one there that could do that, and I was asked to stay there, but due to my father's health I was unable to accept the offer.

Q. How many summers were you there?

A. I don't recall.

Q. More than one?

A. Yes, I was there five or six summers at least.

Q. You say you had an offer to go into the drafting room?

A. I was asked to go into the drafting room, yes.

Q. You had no experience in drawing, I take it?

A. Only on the work that I had done for my father and for Mr. Herreshoff down here.

Q. You would have had to go into the drafting room and work your way up?

A. I presume that was the intention; they wanted someone who had some structural knowledge, who had a knowledge of drawing as well as construction, and that is more than you find in the ordinary draftsman.

Q. Mr. Herreshoff was a constructor of sail vessels, wasn't he?

A. Not entirely.

Q. That principally was what he did, wasn't it?

A. In the later years, yes.

Q. What do you mean by "later years"?

A. The last ten or fifteen years of his life. He constructed both power and sail; in the early years he was in steam.

Q. It was during the last years that you had experience with him, I take it?

A. That is right.

Q. What sort of vessels have you designed?

A. Principally auxiliary sailing vessels or cruising vessels.

Q. What types?

A. Just what do you mean by "type"?

Q. You say you designed auxiliary sailing vessels; I want to know what they are like.

A. Some were centerboard boats, and some were keel boats, some ketch rigs and some schooner rigs.

Q. How big were they?

A. 60 and 65 feet.

Q. You have no qualifications for designing other than practical experience, the experience that you testified about?

A. I consider that quite a big asset.

Q. You say you didn't go into the drafting room at Herreshoffs; did you ever serve time in a drafting room anywhere?

A. I have never served time in any drafting room except my own.

Q. You say that you are called on for insurance surveys by two other companies which have interests here in Miami, is that right?

A. Yes.

Q. How many such surveys did you make in the past year?

A. I am not sure just how many, about a dozen maybe.

Q. For what period of time have you been averaging as many surveys as that?

A. Well, I have been surveying for one company for three years and for another one about two years, or more. I have forgotten just when I did start. The first survey I did I know was in 1929 or 1930.

Q. Were these surveys that you made for them principally damage surveys?

A. No, they were new policies.

Q. What rules do you recognize as standard practice in making a survey of a vessel for insurance purposes?

A. I don't know that I observe any particular rules.

Q. I didn't ask you what you observed; I asked you what rules you regarded as standard?

A. I don't consider any of them standard.

Q. Then you make your own rules?

A. I apply my observations to the conditions of the vessel and the type of vessel; I don't think you can apply a rigid set of rules to all vessels under all conditions.

Q. You know that there are many sets of rules that have been made up to deal with such conditions, do you not?

A. Yes, I know of the existence of them.

Q. Do you consider that all these insurance companies expect of you, when you examine a vessel, that you should use your own experience?

A. They must, because all I send to the insurance company office is a detailed report of what I find on a boat, and with recommendations as to any change in the ventilation, and if they don't care to accept the boat as she is, then they write me and ask that certain changes be made before the policy will be written. I have recommended in several cases that policies be not written on certain boats, and they accepted.

Q. You say that you are familiar with these rules of the National Fire Prevention Association?

A. I know of their existence, yes.

Q. Referring now to Libelants' Exhibits 25 and 97.

A. I know of their existence, but I don't know them word by word.

Q. Are you generally familiar with the contents of them?

A. I can't say that I am generally familiar with the entire contents of them.

Q. Do you refer to them from time to time in examining vessels?

A. I have no copy of them.

Q. You have no copy of them?

A. I have no copy of them, so I don't refer to them.

Q. You refer to no rules whatever when you examine a boat?

A. That is right. I will say one thing: that no vessel that I surveyed has had any accident aboard her.

Mr. Matteson:

I move to strike that out; it is not responsive to any question.

The Court:

I think it is subject to being stricken. The motion is granted.

Q. Isn't it a fact, Mr. Monroe, that these rules or other rules represent standards which you at least attempt to approximate?

A. I probably do approximate them, yes. Probably my ideas coincide with the rules set apart there, but I can't say that these rules can apply to all conditions, especially here in this climate.

Q. What is there different about the climate of Florida and the climate anywhere else with respect to the safety of gasoline vessels?

A. These rules are set down to accommodate vessels in a cool climate, where your enginerooms are usually closed up, with the exception of your cowl ventilator; with no ports on the side of the vessel at all. Here we have a warmer climate and gasoline vapors will evaporize much easier, and you can leave your ports open on the side of the vessel.

Q. It is true, I take it, that because of the warmer climate you do get a greater evaporation of gasoline here, is that right?

A. That is right.

Q. And evaporation of gasoline is a source of explosion on auxiliary vessels; is that correct?

A. That is correct. The more it is diluted the less chance of explosion.

Q. And the only reason you think that there is any difference is because you think there is greater opportunity to keep the windows open down here than in other places, is that right?

A. It is possible. It is possible to ventilate down here easier than in the north.

Q. Of course it is true that gasoline vapor is considerably heavier than air?

A. Yes.

Q. It is true that it tends to collect in low places of a vessel, is it not?

A. That is correct.

Q. Then if it were necessary to have bilge ventilation in one part of the country, it would be just as necessary to have bilge ventilation in another, would it not?

A. I think you could get ventilation into the bilge without necessarily having a cowl ventilator going all the way to the bilge.

Q. Do you happen to know where the Seminole was built?

A. No.

Q. Isn't it a fact that she was built in the north?

A. She may have been. I didn't examine the records to see where she was constructed. I presume she was built in the north, as she was of steel construction.

Q. If gasoline vapor tends to accumulate in low parts of a vessel, that would certainly be just as true in Florida as anywhere else, wouldn't it?

A. It would settle here just as well as it would in the north, yes.

Q. The warmer the climate the more quickly it would settle?

A. Yes.

Q. There would be a greater discrepancy between the density of gasoline vapor in warm air than gasoline vapor in cold air?

A. You are getting into testimony out of my line; I am not a chemist.

Q. It is equally true that the air that you do get into the windows, with such ventilation here, would likewise be warm air?

A. Yes, it would be warm air.

Q. It is also true, is it not; that a very small percentage of gasoline fumes mixed with air would create an explosive mixture, wouldn't it?

A. I don't know.

Q. You don't know anything about that?

A. I don't know anything about the combustibility of gasoline; I am not an expert on combustion.

Q. I find here in one of the exhibits, Exhibit 24, a statement that only three per cent. of gasoline fumes mixed with air, makes a mixture that might be explosive. Do you agree or disagree with that statement?

A. I am not in a position to make any statement concerning that at all.

Q. You do not question the accuracy of that?

A. I don't question the accuracy of it; he probably studied it; I haven't.

Q. Now you agree that it would have been possible to drain all the gasoline from the tanks of the Seminole, do you not?

A. That is correct.

Q. You agree that there was a V-shape angle in the bottom of these tanks around the concave bottoms, all around, where whatever liquid was in the tank would remain continuously?

A. That is correct.

Q. You agree that in any gasoline tank you get a certain amount of water due to condensation or other causes?

A. That all depends on the size of your vent pipes.

Q. Now, Mr. Monroe, you were explaining to us this morning how the size of vent pipes affect the amount of condensation in the gasoline tank. I didn't quite follow you on that. You say that there is expansion or contraction of the liquid in the tank due to change in temperature?

A. No, not in the liquid.

Q. What is the expansion?

A. It is the air that is in the tank; a full tank will not breathe, so to speak; it will not breathe through a vent pipe, though an empty tank will.

Q. You say that if you have a smaller pipe for a vent you won't get as much condensation?

A. No, because she don't get the volume of air. It would be a slower process and you will have more chance for the air to condense on the way as it goes in and runs back out again.

Q. The area of a small pipe is less than the area of a big pipe?

A. That is correct.

Q. So you really have more condensation surface in the larger pipe?

A. You would.

Q. As far as the amount of air that goes in or out of a tank, due to contraction or expansion, the amount of air would be exactly the same, whether you had a large pipe or a small pipe, wouldn't it?

A. It depends on how long a period, and the difference between pressure between the outside and inside of the tank.

Q. You don't have any idea that a vent pipe half inch in size would restrict the ingress or egress of air from a tank such as a five-hundred gallon tank on the Semi-nole, do you?

A. These were two thousand—

Q. I am talking about one tank.

A. It would restrict it to a certain extent; it would slow up the flow.

Q. You think a half-inch pipe would slow up the flow?

A. It would slow up the flow of air going in and out of that tank.

Q. A half inch hole is a big hole?

A. Yes.

Q. For air; is that true?

A. It is sufficiently large enough for some uses, for that vent pipe.

Q. Is this contraction or expansion a slow or quick process?

A. Well, it is a slow process.

Q. It would be very, very gradually slow, wouldn't it?

A. It might occur over a matter of several hours, yes.

Q. So that the movement of air in or out of a vent pipe to accommodate contraction or expansion would be very slow at best, wouldn't it?

A. Yes.

Q. Do you really think that under these circumstances it would be slowed up to any extent by the diameter of a half-inch pipe?

A. Yes, indeed; a little more than a two-inch pipe.

Q. Whatever air went in would be the same air, whether it was a small pipe or a big pipe, wouldn't it?

A. Yes, it would be the same air after it got in there.

Q. If it was moist air in one pipe it would be moist air in another pipe?

A. I still don't believe that the same amount of moist air will go through a small pipe as will go through a large one, even in the same length of time.

Q. How much flow of air per minute do you think would be necessary to accommodate a half-inch vent pipe on the Seminole to take care of the contraction on expansion which might take place there?

A. I don't know; I haven't attempted to figure it up.

Q. Don't you think that a half-inch pipe would take care of a complete change of air in a tank such as on the Seminole gas tank, in five minutes?

A. No, sir.

Q. Now with respect to the drip pans under the four tanks; I think you called them drip pans, did you not?

A. I think that is correct.

Q. What did these drip pans rest on?

A. They rested on angle supports and also the walls primarily, and the walls of the bulkheads.

Q. The angle iron supports were attached to what?

A. Partly to the bulkhead and partly to the stanchion underneath.

Q. You say that the angle supports were fastened to the bulkhead?

A. I believe they were partly to the bulkhead and partly to these longitudinal angles running at the bottom of the bulkhead.

Q. How were they fastened to the bulkheads?

A. I didn't observe close enough to see whether they were riveted or bolted.

Q. Do you see any fastenings in this picture—I show you Exhibit 9—between the angle supports and the gas tanks and the bulkhead?

A. I can't determine any in that photograph, no; there are several rivet heads and bolt heads showing there, but I don't know where they go.

Q. Can you say positively whether or not these angle iron supports to the tanks were fastened in any way to the bulkheads?

A. They were indirectly fastened to the bulkhead, but apparently were fastened to the angle that runs horizontally along the bulkhead, and the bulkhead was also fastened.

Q. I don't understand what you mean.

A. I mean that the supports were fastened to the angle iron.

Q. You mean at the bottom of the—

A. No, the longitudinal stringer across the bulkhead at the bottom of the tank.

Q. You mean they were riveted to the bulkhead; you mean to the bulkhead itself?

A. The bulkhead was also fastened to that angle.

Q. Now, you are talking about the foundation?

A. I am talking about the foundation of the tanks; the trays.

Q. Right down at the bottom of the ship.

A. Below the bottom of the ship.

Q. Close to the bottom?

A. The trays that the tanks sat in.

Q. I am talking about the angle supports.

A. Angle iron supports to what? I guess I am talking about one thing and you are talking about another thing.

Q. I will try to clear it up. The trays rested on angle irons which ran fore and aft?

A. That is correct.

Q. What spacing was there between them; have you any idea?

A. I don't know; I didn't measure it.

Q. About a foot?

A. It might have been.

Q. Those fore and aft pieces that were directly under the trays were supported by something to keep them off the bottom of the ship?

A. That is correct.

Q. What were they supported by?

A. They were supported by the framework that held the bulkhead on the after side.

Q. They were supported by vertical angles, were they not?

A. Vertical angles, and also the longitudinal angles that ran athwartships of the vessel to the back, and the bulkhead which was the forward end of the engine-room; the forward end of the tank compartment didn't go down to the floor; it only went as far as the main floor.

Q. These vertical angles went down to the bottom of the ship?

A. Yes.

Q. How did they fasten there?

A. I didn't examine them close enough to find out; I assume they fastened to the frame.

Q. You say they also fastened to another angle; is that what you say?

A. There was another angle crossing the bulkhead.

Q. Is that on the interior of the tank compartment?

A. Directly under the tank compartment, on the compartment side; it doesn't show in the engine-room.

Q. Was that angle fastened to the engine-room bulkhead?

A. I believe it was.

Q. I show you this exhibit, Libelants' Exhibit 9, and ask you to show me where these fastenings come there on the engineroom side.

A. I can't say just where; I don't know whether I can show you or not. I see here a row of rivets running horizontally across there, and here is a row of rivets here (indicating).

Q. These (pointing) are below the bottom of the opening that went under the tank compartment?

A. I see the hole now, but I didn't see it at first. The rivets are up in here (indicating), and there may have been rivets in back of this thing before this stiffner was put in here.

Q. Can you show us that angle in any of the photographs which are exhibits in this case?

A. I haven't looked for it; I don't know whether it would be possible to find it or not.

Q. Can you show us that angle in any of these three exhibits introduced this morning, referring to exhibits 5-J, 5-K and 5-L; just look down in the tank compartment there (pointing).

A. Yes, they are all above the trays—I can't see under the trays.

Q. I take it that you did not actually observe that they were so fastened?

A. I know that the trays were fastened to the framework there in places, but I didn't measure them.

Q. I am not speaking of the trays fastened to the framework; I am speaking of the structure under the trays.

A. I didn't examine it closely.

Q. So you can't tell us definitely whether they were attached to any angle on the forward and after bulkheads or not?

A. No, I couldn't say.

Q. Now, getting to the trays; did I understand you to say that they were fastened or simply laid in?

A. They appear to have a fastening; the vertical side of the tray appears to be fastened to the bulkhead; I don't know whether it is fastened to the bulkhead or whether it is just put in there to keep the tray in position in the compartment; I couldn't tell you.

Q. You can't call our attention to any of this spacing in these exhibits here?

A. No, because—well, in this photograph here, Exhibit number 9, this is on the outside of the engineroom side of the bulkhead, and underneath you couldn't see that one.

Q. Naturally that fastening didn't come over?

A. I don't know whether that came through the frame or one of these angles down here (pointing).

Q. Such frames as there are on the engine-room side?

A. That is correct, the vertical frame.

Q. So any fastenings to these frames should appear on the engineroom side?

A. They might have used the same hole of the bolt, right through the bolt, and then into the frame, the vertical frame, and not be shown as a separate rivet.

Q. The bolts are riveted together?

A. They are in that place (pointing).

Q. Where do you see any bolts in the removable plate?

A. Of course the removable plate had bolts in it.

Q. Of course that was in the center of the bulkhead?

A. Yes. There are a few bolts in them; not all rivets. As I recall, there were occasional bolts along there (indicating); and there were bolts over here (indicating), I think; I wouldn't be sure about that. I remember seeing bolts there.

Q. What was the size of these angles that form the supporting forms for the tanks?

A. I didn't measure them; I didn't think it was necessary to note those.

Q. Would it be about an inch and a half on this side of the angle (indicating)?

A. Roughly, I will say they were an inch and a half or an inch and three-quarters; those that I remember seeing underneath there.

Q. So that this platform that was built up with these angles was supported simply where the bottom of the vertical angles were made fast to the stringers of the ship's walls, is that right?

A. Yes.

Q. And possibly with a few fastenings to the bulkhead itself; is that correct?

A. That is my impression of it.

Q. As far as fastening to the bulkhead, that is only possible?

A. I didn't examine the supports of these trays; I didn't think it was necessary, so I didn't examine them carefully.

Q. In other words, the tanks were not supported on any part of the frames of the vessel itself; the platform was a separate structure built in there for that purpose, is that right?

A. As I gather it, that point was supported from the frames underneath the main frames of the vessel, or stringers, and what was down underneath that mud I don't know.

Q. I mean of course at the bottom where they were fastened to the stringers; that was the only place they were fastened; in other words, they were not resting on any part of the original structure of the ship; it was a specially built platform in there for that, is that right?

A. That is the way I see it, without a detailed examination.

Q. This one that appears in the doorway here has been bent over and closed; do you recall that?

A. I recall that, yes.

Q. How do you account for that?

A. I don't account for it; I don't know how it happened; I have no theory on that at all.

Q. Now this photograph here, exhibit 5-J; is that just the way it looked when you first saw it?

A. That is just the way it looked when I first saw it; there was nothing disturbed.

Q. Nothing removed from that space?

A. Nothing removed or disturbed.

Q. Now this photograph, exhibit 5-L, shows the vertical stanchion—I believe that is what you called it—between No. 1 and No. 2 tanks.

A. That is correct.

Q. And there was a stanchion such as that between No. 1 and No. 2 tanks also between number 2 and 3 tanks and between No. 3 and 4 tanks; is that right?

A. I assume that, because this one is the only one that was projecting above the ash at all; after we cleaned out the ash between tanks 3 and 4, a piece of such stanchion was still visible; the top of it had been burned off; I didn't clean out between No. 2 and 3 tanks.

Q. As I understand it, these braces were inserted between number 1 and number 2 and between No. 2 and No. 3 and between No. 3 and No. 4 tanks?

A. That is right.

Q. In this photograph, exhibit 5-J, there was no similar stanchion on the port side of No. 1 tank.

A. There was no remains showing there, if there was one in there; if there was one there I didn't see any signs of the remains of any; it might have been there; that was all open and could have been easily consumed in the fire.

Q. Then these stanchions and the bases between them were largely separators for these three sets of tanks; is that right?

A. They were separators.

Q. And the ones that were braced on the port side of the ship could move in unionism between or toward the port side, if there was any?

A. Yes, it could be done, but I don't know how they were tied at the top; if they were tied together at the top as they were at the bottom I believe the three stanchions would hold the four tanks.

Q. Was there any spreader between the number 4 tank and the starboard side of the compartment?

A. I found no remains of any.

Q. You called our attention here to the remains of one of these upright stanchions in this Exhibit 5-L. Did you observe how that stanchion was fastened in place?

A. You mean at the bottom?

Q. Anywhere.

A. I didn't examine the bottom of that stanchion at all. I didn't check into the edges.

Q. Did you on any other stanchion?

A. No, sir.

Q. Where the number 4 tank was removed, the upright stanchions were clearly visible?

A. The heels of them were, yes.

Q. Isn't it true that they were mortised into the four by four frames that were under the trays?

A. They may have been; I don't know.

Q. You observed no other means of the fastening of these stanchions in place?

A. No. There is an indication of a beam being gone from the top of the tank compartment, but that is only a theory—an indication of a beam having been there.

Q. What kind of a beam?

A. Judging from the size of the opening, the starboard end, I would say it was a V-beam or a T-beam—a metal beam.

Q. Do you refer to this opening shown in Libelants' Exhibit 6?

A. That is correct; that is the opening I am speaking of.

Mr. Matteson:

I think we called attention to that at the examination, your Honor.

Q. Shall we mark this "opening for beam"?

A. Yes, opening for beam.

Q. That apparently is an opening in the side of the compartment that was used for gasoline tanks; that was an area intended to accommodate a beam?

A. That is my assumption.

Q. Did you observe whether or not there was any place where such a beam could have been fastened in place at its ends?

A. On the forward end I think the main frame of the vessel, the intermediate frame of the vessel, was slightly bent; there was one about that position where the bottom of the angle occurs.

Q. That is on the port side?

A. On the port side, and a like one on the starboard side.

Q. Do you think it would have fastened to one of the uprights along the side of the ship?

A. The intermediate frames, yes.

Q. If that was the case, how would it have been fastened to such a frame?

A. Either bolted or riveted, either one; the beam has been torn loose and the end of the frame is all distorted—the holes in the end of the frame.

Q. Would there be a bracket to support a beam at that point?

A. You mean a gusset?

Q. Gusset or bracket.

A. There might have and there might not have, depending on whether it was structurally necessary. We don't put gussets on every beam.

Q. You mean you don't put a gusset on every beam on a steel vessel?

A. It is not absolutely necessary, depending on what the above is above it.

Q. Such gussets are put there for rigidity or strength?

A. That is correct; you might put them on every other one but not every one.

Q. There is no evidence of there having been any other beam than this beam that you speak of at that height of the vessel?

A. I don't recall seeing any gussets on the frame that you are speaking of.

Q. Or any other beam?

A. That is right.

Q. Referring to Libelants' Exhibit 6 again, what was in the top of the bulkheads of the tank compartment; can you tell us; what was there to stiffen it at the top?

A. I couldn't tell you; I never saw it before the fire.

Q. There certainly wasn't any steel angle across the top?

A. There might have been.

Q. If there had been such an angle it would have been riveted there in part of the structure?

A. The plates would have been fastened to it probably.

Q. How do you account for such an angle not being here at the time this picture was taken, or at the present time, if it was there at the time of the fire?

A. When that entire steel hatch was taken off the engineroom it was probably moved out; I don't know how that was taken off.

Q. Did you observe the end of the steel hatch to see whether there was any evidence of a fastening here (pointing)?

A. It is impossible to see the inside of that steel hatch in its present position.

Q. There is no angle in the top of the forward bulkhead there, is there?

A. No.

Q. And that cpening was attached to the steel hatch?

A. I don't know; it may have been.

Q. As a matter of fact you see no evidence that there ever was a steel angle bracer at the top of these bulkheads?

A. There were bolts or rivet holes in the top of these plates or bulkheads, indicating that something was up there; that something "steel" was up there.

Q. As a matter of fact isn't there just as much indication that there was a wooden beam across there as there is that it was a steel beam?

A. There might have been wood across there; there are remains of wood screws in places.

Q. At the top of the—

A. Yes.

Q. And a number of holes?

A. Yes. There could have been wood pushed in there instead of a metal beam.

Q. How about the after bulkhead of the engineroom?

A. Similar condition.

Q. There was no angle across the top of that, was there?

A. Not as it is now.

Q. And the holes that were found at the top of the bulkhead contained wood screws?

A. I saw some in there, yes. There may have been a wood filler in there with a steel beam behind it. She had a wooden deck.

Q. Now what was there then about the bulkheads on the tank compartment to give horizontal rigidity; I mean fore and aft?

A. I don't know; there was nothing left to determine that from; certainly there must have been something there, as it didn't hang there by itself.

Q. Of course it would stand in place with its vertical stiffness, wouldn't it?

A. To a certain extent.

Q. It would stay in place?

A. Yes, it would stay in place.

Q. If it had no horizontal stiffening there would be nothing to prevent its weaving if there was any pressure turned against it?

A. It is logical that a beam was there, so—

Q. I am just assuming from the testimony that there wasn't. If there wasn't, there would be nothing to prevent it from weaving in that manner, would there?

Mr. Underwood:

Prevent what from weaving?

Mr. Matteson:

The forward and after bulkheads.

A. No, nothing as far as we can tell now.

Q. A wooden beam across there would certainly not be as satisfactory for the purpose of insuring rigidity as a steel angle, would it?

A. Maybe not quite but if it was heavy enough it would answer the same purpose.

Q. If there was any tendency for these bulkheads to weave fore and aft by the vibration of the movement of the vessel, that of course would put a strain on all of the fittings attached to the tanks?

A. Not if the tanks didn't move.

Q. If the bulkheads moved the tanks would be likely to move?

A. Not necessarily; they could move quite a little bit without touching the tanks.

Q. Did you measure the width of the tank compartment from forward to aft?

A. I believe I did.

Q. In doing that did you allow for the distortion caused by the explosion and fire?

A. I took it to the ends where the bulkheads were not distorted.

Q. You agree that that was 43 inches?

A. I believe that that is right; it was about 43 or 44 inches. I don't recall my exact measurement right now.

Q. If the tanks themselves were 42 inches in diameter, as I think you measured them, there would be a space between the side of the tanks and the forward and aft bulkheads not over one-half to one inch?

A. There was more space than that.

Q. I am only asking you as a matter of mathematics?

A. I know, but there is something wrong with that measurement, with your measurement. I do know that there is more space than that between the bulkheads, because there is space enough between the side of the tanks and the bulkheads to put my hands down between them.

Q. Just where was that space; I mean was it in the bulkheads?

A. In the bulkheads, the forward and top bulkhead and the next one. The number 4 tank compartment is the only one I dumped the ashes out through that space.

Q. As a matter of fact, in the space left after you removed the number 4 tank, where the tray underneath it was visible, there was a space of not over one to two inches between the end of the tray and the starboard bulkhead; is that the way you observed it?

A. Yes.

Q. Isn't it a fact that forward and aft the tray came up practically to the bulkheads and there was hardly no space?

A. There was space enough there for me to put my hand down there; it was one to one and a half inches.

Q. Are you sure that wasn't due to distortion?

A. It couldn't be distorted; it was all too rigid there.

Q. What was too rigid?

A. The tray and the framework around the bulkhead.

Q. Of course the bulkhead might have been distorted?

A. It showed no signs of distortion; the sides of the trays and the bulkheads were parallel.

Q. You say now that there was space enough for you to get your hand between the tray and the bulkhead. How much space did you say that was?

A. Full inch to an inch and a half.

Q. Did you also say that the trays were fastened to the bulkheads?

A. I believe the trays were fastened to the bulkhead plating; just how I don't know, but there was a spacer in there.

Q. At least they were not fastened close against it?

A. They may have been fastened, and there may have been only a spacer to keep the tray from moving around in the compartment.

Q. How about on the forward bulkhead?

A. The same thing.

Q. Any spacers there that you saw?

A. There were spacers in there.

Q. Did you see them or—

A. I saw them there.

Q. Now referring to the tanks themselves; you observed that the tanks were steel tanks and that there was no evidence of caulking them, did you not?

A. There was no evidence on the outside that I could see of caulking.

Q. Of course at least on the bottom of the tank, the only place that the tank could have been caulked would have been on the outside; is that correct?

A. I think that was covered with solder.

Q. And there was no caulking along the sides?

A. Not that I could determine.

Q. Do you know any rule about the spacing of rivets, as to how closely they may be spaced, as a minimum with respect to the diameters of the holes?

A. There is a rule, yes, but I don't have it memorized.

Q. How many diameters of your holes do you have to leave between holes in order to leave sufficient metal to have the proper strength?

A. I don't carry that in my mind; I refer to a manual when I need that; I very seldom use such a thing.

Q. Isn't it a fact that the holes must be spaced not nearer than four diameters?

A. I don't know.

Q. I take it that you do not have much call for information with respect to riveting in your angle of the profession, is that right?

A. Very seldom, yes.

Q. You spoke this morning of the rivets being spaced one-inch to one-and one-sixteenth apart, and you estimated the holes to be a half inch or so in diameter; is that right?

A. They are not over half inch; they are a little under.

Q. That would be spacing, if that were true, of approximately two diameters?

A. That would be two diameters, yes; center to center.

Q. Center to center is what I am talking about.

A. All right.

Q. As a matter of fact you are not sure what the size of the shanks of the rivets or the holes they pass through might have been?

A. You can tell that by drilling one of them out.

Q. As a matter of fact, Mr. Munroe, one familiar with riveting could determine that from an inspection of the heads?

A. There is a standard size head for the shank of certain rivets, yes.

Q. You don't know what that is?

A. No; when I need that I refer to a manual.

Q. Have you had any experience in the making of cylindrical tanks?

A. Not of that size, nor of riveted tanks.

Q. You have had no experience in that?

A. No, I never made one.

Q. As a matter of fact you would not, even with your experience, rely on a tank that was merely riveted to retain gasoline or any other liquid, would you?

A. If that tank was made for it I would rely on it, yes.

Q. Did you ever hear of a tank that was made for such a purpose without being either caulked or welded?

A. I know that there have been numerous occasions where tanks of that type, although smaller, have been used for gasoline, but whether they were caulked or not, if they were galvanized by a manufacturer, I rely on them.

Q. As a matter of fact you would not trust a plate on the side of a ship that was riveted unless it was caulked, would you?

A. No.

Q. And so much less would you trust a tank for the retention of gasoline that had been riveted but not caulked?

A. The side of a vessel gets a great deal more strain on it than these gasoline tanks ever get on them, more constant jarring and straining.

Q. Caulking is not a matter of strength, but caulking is a matter of tightness, is it not?

A. That is true, but you have to rely on the caulking where you have a variable strain on your plating.

Q. Would you recommend under any circumstances a cylindrical tank that had been riveted but not caulked or welded for gasoline?

A. I would test it first before I would put it in there, but I would rely on it without it being soldered or knowing whether it was caulked or not.

Q. What sort of a test would you make?

A. I would put a hydrostatic test on it, or even an air test. I would test any tank before I put it in a boat; and it is easier done by air pressure.

Q. Is there any difference between gasoline and water as to permeability or penetrating quality?

A. Yes.

Q. What is the difference?

A. I don't know the exact difference, but there is a difference in the viscosity of liquids.

Q. In other words, it is a well known fact, isn't it, that gasoline has a considerable greater penetrating quality than water?

A. That is right.

Q. It also has a cutting quality; in other words, it will cut through rust or other materials that might accumulate?

A. It might on certain materials.

Q. As a matter of fact, Mr. Munroe, you use gasoline sometimes for freeing pistons as they rust in places?

A. I wouldn't use gasoline.

Q. Or some similar oil?

A. I would use a light oil but not gasoline.

Q. That illustrates the principle?

A. That illustrates the principle, yes.

Q. Well now I will put it this way: when you make a hydrostatic test you test the strength of a tank, do you not?

A. I do.

Q. Do you make the hydrostatic test with water?

A. That is right.

Q. And water doesn't have the same degree of penetration effect than gasoline or light oil would?

A. Not at the same pressure, no.

Q. In other words, a hydrostatic test is principally a strength test, is that correct?

A. Yes, that is correct. It is for strength or for any small leaks; if there are any small leaks it will show up along the seams of whatever you are testing. You can test it and if the metal was porous it would force the liquid through the metal if it was porous in any place.

Q. I understood you to say that you would not trust a tank that had been riveted and not welded or caulked, unless you were satisfied by some proper test that it was also gas-tight?

A. That is only natural. You are not going to install a tank in a compartment and then go in there and find that it leaks and then take it out again. Even a caulked tank might leak if it wasn't properly caulked.

Q. Caulking is the ordinary precaution to take to make a tank tight?

A. If it is going to be put under any great pressure, but under low pressure such as this it wasn't necessary.

Q. As I understand it, you said you observed evidence of solder on this tank before it was taken out of the Seminole; is that right?

A. Yes, that is right.

Q. Did I understand you to say that there was evidence of solder around any of the rivets?

A. There was on the lower line of rivets on the bottom; there is an indication of solder on them.

Q. On the outside of the tank?

A. It is pronounced on the inside of the tank, but due to the flaking or rust on the outside of the tank a majority of it has been removed, removed by the flaking and that rust.

Q. And this occurred, as I understand it, since last May when you first observed it?

A. This was observed since last May. Of course there was some flaking on there when the tank first came out of the compartment. I knocked it off in getting down to the clean rivet and clean seam, so that I would be able to examine it and not have the examination made through rust.

Q. Then there was an accumulation of rust under the solder which caused it to flake off; is that correct?

A. That is correct, but that only occurred since the fire.

Q. That is your assumption.

A. (No audible answer.)

Q. In any event, whenever it happened, that is something that will account for the removal of the solder if rust does get underneath it; is that correct?

A. Solder will flake off if it is on top of rust; it only penetrates as far as rust and only makes contact with the rust.

Q. And that can occur after the solder had been applied, of course?

A. Yes; after the solder is applied and worked down to the sides.

Q. How is solder applied, do you know?

A. Solder is applied by the use of an acid flux and a soldering iron; it is sometimes done with an open flame. The flux is put on to clean the metal up and make it perfect between the two metals.

Q. Of course solder on the outside of the tank would not protect the tank from inside corrosion?

A. No, it wouldn't.

Q. The best it could do would be to offer a support at the extreme outer edge, is that correct?

A. It acts as a support on the outside, yes.

Q. And if any rust gets under the solder and flakes off, it doesn't even do that, does it?

A. No, not if it is rusted.

Q. And the quality of iron is such that it is subject to rust?

A. It varies with the type of steel, whether it is steel or iron.

Q. Now take this bottom seam, you see that there is a sort of crack, I will call it, or notch, where the bottom of the tank didn't come down quite so far as the side of the tank; is that correct?

A. That is correct.

Q. And that notch, according to your observation, had been filled up with solder?

A. It was.

Q. To begin with, there is no question but that it had never been welded, is that correct?

A. I don't know.

Q. You didn't see any evidence of welding on it?

A. I didn't remove any of the solder to determine that.

Q. Would you have been able to see it without the removal of the solder?

A. I assume that there was no welding there.

Q. You think that crack or notch had been filled up with solder?

A. I believe it was entirely filled up with solder; wherever I saw it, it was; there were one or two small places where the notch wasn't completely filled and smooth.

Q. Of course it would have been impossible to put solder or anything else on the sides of these tanks while

they were in place in the compartment, with the bulkhead in place?

A. No, you couldn't put the solder in there; you would have to turn the tank on its side or end and solder the bottom of it.

Q. You would have to take it out in order to work on it?

A. The tanks would have to be out of there in order to solder them.

Q. If this bottom piece was soldered, as I understand it, the tank stood up in place on a wooden base in the tank compartment?

A. That is correct.

Q. So that it was resting on the edge where this solder had been applied; right?

A. That is right.

Q. And it was resting on wood, wasn't it?

A. On wood.

Q. And I suppose it would have a tendency to cut somewhat into the wood?

A. It would have a tendency to compress the wood.

Q. What effect would that have on the solder after it was applied to the bottom of the tank?

A. No effect at all.

Q. It would place a strain on it?

A. It would have a tendency to force the solder up into the wood at that angle.

Q. Whatever the effect, Mr. Munroe, it would have had the effect of placing a strain on the solder, wouldn't it have?

A. The solder would bear some weight, but I wouldn't say it was anymore strain—not as much strain as metal itself; not a damaging strain anyway.

Q. All around this bottom edge where you thought the solder had been applied there were places where there was no solder present at the time you observed it?

A. There was no solder at all. There was solder there. but it was not filled up as full as the other parts of the rim or the edge.

Q. When we were there the other day there were spaces where there was at that time no evidence of solder at all?

A. No more than what I have spoken of.

The Reporter:
May we have a recess.

The Court:
Yes. We will take a five-minute recess.

(Recess.)

(By Mr. Matteson):

Q. We were speaking a moment ago about the subject of interior corrosion. What causes interior corrosion of a tank?

A. Due to the moisture from the chemicals that are in the fluid contained in the tank.

Q. And gasoline has such a fluid, does it?

A. I believe the present gasoline contains considerable acid that is not entirely washed out.

Q. And any moisture or water accumulated in the tank of the type of the Seminole would accumulate in that crease around the bottom?

A. It would accumulate there, yes.

Q. And the effect of such water or acids from gasoline would be to corrode metal?

A. Yes, it would work faster in the presence of air and oxygen.

Q. There is always a certain amount of air in water?

A. A certain amount, yes; and a small amount of oxygen.

Q. You have experienced very considerable tank corrosion in tanks containing water only—steel tanks?

A. Yes.

Q. You spoke of steel or iron with respect to the effect of corrosion, I think. What is the difference between steel and iron in that respect?

A. Pure iron doesn't rust or corrode except in a fine powder. Steel, when it oxidizes, builds up a flaking, but not necessarily does it remove a great deal more of the original metal. It has a swelling tendency in steel.

Q. When you speak of pure-iron do you mean cast iron?

A. No, I am speaking of pure wrought-iron.

Q. There is a difference between cast iron and steel?

A. There is.

Q. With respect to corrosion?

A. Yes; cast iron varies, too.

Q. Which is more subject to corrosion, cast iron or steel?

A. Steel.

Q. When steel corrodes it is subject to what is called pitting, is it not?

A. That is correct.

Q. In other words, instead of corroding evenly it corrodes in holes or pits, is that true?

A. It will in some places more than others, and that is true of any rolled metal.

Q. You didn't make any test of any of these other tanks, did you?

A. No, sir.

Q. Did you move number 1 tank in the course of this investigation you made in May?

A. No, sir.

Q. The reason that I ask that is because these photographs which you have shown here, for instance Exhibit 5-K, show the number 1 tank displaced to starboard, which I estimate is about six inches; is that about right?

A. I would say that it is around five or six inches; that is hard to determine; five inches maybe.

Q. I show you this photograph, Libelants' Exhibit 4. That shows the opening for the number 1 tank with the valve in place, doesn't it?

A. Yes. I don't know whether that is the number 1 tank or not.

Q. I believe the testimony indicates that it is. If that were the fact, that the fixture shown in the opening in Libelants' Exhibit 4 is the number 1 tank, the number 1 tank must have been practically in place at the time that picture was taken, wasn't it?

A. I believe that that is the number 2 tank.

Q. Be that as it may, if the statement I just made is true, then the number 1 tank must have been substantially displaced at that time?

A. That tank as shown in that photograph is approximately from the center of the hull; it is merely tipped to one side. I think you will find that to be the number 2 tank.

Q. We will take that up later. In any event, you are sure that you didn't move number 1 tank at that time?

A. I am sure that I didn't touch number 1 tank at all.

Q. Who was present—just a minute. Were number 2 and 3 tanks moved at that time?

A. Neither number 1 or number 2 tank was disturbed.

Q. Who was present at the time you moved number 4 tank and made these tests that you spoke of?

A. The man there at the yard that handled the derrick; I don't know who he was. I believe Mr. Newell himself was handling the—

Q. He is the man you spoke of as your assistant?

A. No, sir. I hired Mr. Newell to take the tank out, and that was all. He had to handle the derrick; that wasn't my job to handle the derrick.

Q. What date was this done?

A. I don't recall the exact date.

Q. Do you recall the day of the week?

A. I believe it was Monday or Tuesday. We started to do it on Saturday but it rained and I couldn't get anything done, couldn't get the boat pumped out; so I think it was Monday or Tuesday that the work was done—it was either Monday or Tuesday that the work was done.

Q. That was after the Court had adjourned at the last session on Friday?

A. Yes, sir.

Q. You began your operation on Saturday and completed it on Monday or Tuesday; is that correct?

A. That is correct.

Q. Was Mr. Thompson present?

A. Mr. Thompson? No, sir. You mean that gentleman, Thompson?

Q. Yes, sir.

A. No, sir.

Q. Was Captain Patten present?

A. No, sir.

Q. Was any one representing the libelants, or the respondent Pilkington, present?

A. Not to my knowledge. None of these gentlemen here, at least.

Q. Was any notice given to them, of what tests you were making?

A. Not by me. It wasn't my job.

Q. By whom were you requested to make the test?

A. Mr. Underwood.

Q. How long were you engaged in making this pressure test on the number four tank, that you described to us, altogether?

A. I believe it was the best part of an afternoon. I know we didn't get away from there until quite late; it was about dark before we left there—before I left there.

Q. Would you say, from two to six, about four hours?

A. It might have been. It took some time to fill the tank with water. I didn't keep an exact check on the time that we worked on it.

Q. And in that period you did all of these things that you have described? Made all these various tests?

A. I made them personally; yes, sir.

Q. And you spoke among other things of fixing a riser at the top of the tank and filling the tank with water to the top of the riser?

A. That's right.

Q. And it was after that, that you capped the vent hole and gave it the City pressure test; is that right?

A. Yes.

Q. How long was that, how long a period of time was that riser pipe under the pressure test?

A. I don't remember the exact length of time; it was probably twenty minutes, half an hour. I know it took some time to go all around the tank and examine everything.

Q. You put it in place and then you went around and examined the tank?

A. I examined all seams and all rivets.

Q. And that took about twenty minutes, you think?

A. Twenty minutes to half an hour, at least.

Q. The tank was in an upright position at that time; was it not?

A. It was standing on its bottom, in an upright position.

Q. And I think you said you went around it with a hammer?

A. I used a machinist's hammer; about a pound hammer, pound and a half hammer; about a pound hammer, I guess.

Q. Did you do that before you filled the tank, or afterward?

A. I did that before I filled the tank; also during the time that it was full; and every time I made a test on it for a different pressure, I sounded it with a hammer.

Q. Did you use any pressure gauges of any kind to note the pressures you were getting?

A. No pressure gauges at all.

Q. There is no pressure gauge to determine what the city water pressure was?

A. I merely inquired from one of the men that I know, in the City water department, the head of the thing, what the pressure was in that locality.

Q. Of course the pressure varies with the length of your connection from the city main, does it not?

A. Oh yes, indeed.

Q. You have the effect of pipe friction and hose friction?

A. Pipe friction and all that to contend with.

Q. Then I take it that you haven't much doubt that there was an accumulation of rust on the inside of the tank, to be knocked loose when you hammered it?

A. No, I do not assume for a minute that there was any sediment or anything on the inside of that tank.

Q. You don't know whether there was or not?

A. No; I can't tell.

Q. It would be natural, under the conditions that that tank had been subjected to for the last four years, that there was a considerable accumulation of such kind in the inside of the tank, is that not right?

A. There is a bare possibility; there is a good possibility that there might have been some scale, from those tanks sitting open as long as they have.

Q. And as a matter of fact there is good reason to believe that the tank was partially filled with water containing a certain amount of debris, at the time of the fire; isn't that true?

A. That I don't know; I don't know. Apparently there was salt water in it at that time, maybe.

Q. Under the conditions under which you made this test, of course any accumulation of debris or rust, anything there may have been in the tank, would have been on the bottom of the tank, would it not?

A. Well, they were in an upright position all the time, yes.

Q. And with this V-shape around the bottom of the tank, it would be natural for any such debris to lodge in that V-shaped formation, would it not?

A. It would be the natural place for it to lodge, yes.

Q. And applying a pressure test, the first effect of this would be to force any such material into that seam; isn't that correct?

A. You can say that it might have a tendency to force it in there, yes. You are still assuming that there is stuff in there, though. I don't know that there was. It might have been displaced from putting the water into the tank. I put that in from the bottom, it had a swirling motion, it would disturb any rust flakes or mud or dirt of any kind that was in that.

Q. Now this filler plug that cracked, the first you noticed of the crack was when you heard the crack, is that right?

A. I heard it; yes.

Q. You hadn't noticed it before that time?

A. There was no crack there prior to my turning the fitting into the threaded hole.

Q. At least not that you observed?

A. I certainly would have seen one if it was there. I examined that very closely.

Q. This connection to which you screwed the hose connection, is a strong, cast-iron connection, I think you said?

A. It is a standard reducing bushing.

Q. And that is made to stand considerable strain, isn't it? You ought to be able to screw a pipe in there as

hard as you can do it by hand, without causing any damage, oughtn't you?

A. I can take a brand new one out, and split the same way I did that one, by setting up the fitting too tight; use a Stilson wrench; using an eighteen inch Stilson wrench on a three-quarter fitting.

Q. Well, what did you use in screwing up this connection?

A. An eighteen inch Stilson wrench.

Q. They come bigger than that?

A. Beg pardon?

Q. Stilson wrenches come much bigger than that?

A. Oh yes; come to four feet and bigger; they come smaller, too.

Q. Well the point I make is simply this; it is quite possible that there may have been at least a flaw there that wasn't readily noticeable, before you started to screw this up; isn't that true?

A. Not necessarily. There didn't have to be a flaw in that casting in order to make a crack.

Q. You didn't take the casting out of the tank, did you, to examine it?

A. No, I didn't remove it.

Q. Didn't examine it on the inside?

A. It certainly was not noticeable on the outer face, if it was there.

Q. Just where was the crack in the casting?

A. It extended from the small hole clear to the outside of the bushing, right straight across, which you would—the type of crack you would get in trying to expand a hole.

Q. Now I didn't visualize it very well. You have a small hole in the tank.

A. You have a small hole in the bushing; you have a large hole in the tank.

Q. And it was the bushing that cracked?

A. It was the bushing that cracked; not the tank.

Q. I see. Well the bushing, is that sort of a reducing connection?

A. That is a reducing bushing, yes, to reduce the hole from two inches to three quarters of an inch.

Q. In other words, it is two inches diameter on one end, and three quarters on the other; is that it?

A. Yes, sir; it looks exactly like a nut with a hole in the center of it—the thread.

Q. And that was part of the original installation of the tank?

A. That was part of the original installation of the tank. It looks just like a plug.

Q. Can you see it in this picture, for instance?

A. You can see the outer edge of it right there.

Mr. Underwood:

Referring to Exhibit Four:

Q. Is this what you have reference to?

A. That is the edge of the plug; yes, sir.

Q. (Marking on photograph.) The edge of the plug.

Mr. Underwood:

Better call it a bushing; it isn't strictly a plug.

Mr. Matteson:

No, the plug wouldn't have a hole in it.

Mr. Underwood:

It is like a plug, except the hole.

A. It is built just like a plug, threaded plug, only in the center of the plug it has another hole with a reduced size.

Mr. Botts:

I don't believe you identified that photograph by number, did you, Leonard?

Q. Referring to Libelants' Exhibit Four.

A. That is a standard bushing.

Q. Is that screwed into the tank, or riveted in?

A. Screwed into the tank. When I examined it after the crack, and heard it, I looked at it and I could distinctly see the bright metal all the way along the crack.

Q. You spoke of the difference between single riveting and double riveting, and the purposes for which single and double riveting are used. In view of what you told me about your experience in riveting, I don't take it that you consider yourself an expert on riveting.

A. I don't say that I am an expert. I have studied it.

Q. You haven't had a great deal of experience with it?

A. I haven't put it in practice a great deal.

Q. And have you—you say you have never had any experience in the construction of tanks, yourself?

A. Not of this type of tank, no.

Q. And consequently I take it you haven't had a great deal of experience in differences between punching and drilling holes for tanks?

A. Not in this particular case, no—this type.

Q. Now referring to these valves, which have been marked Exhibit Eleven: (separating valve stem) you were saying that this flaw or crack that appears in the valve part of Crane number 125, would not cause leakage of gasoline past the valve—reducer gasoline valve.

A. As far as I can tell from this valve, and the shiny part of it, the seat is below—the actual contact between the plug and the seat, is below the hole in the plug

Mr. Underwood:

Below the crack in the plug?

A. Below the crack.

Q. How do you determine that?

A. I determine it by the brightness of the metal. Apparently from this point to there, is the contact seat.

Q. As a matter of fact it is not as bright at the top as at the valve surface.

A. It is slightly—it is not as bright as it is below the crack.

Q. And where it is bright, that indicates that it has had contact with a binding surface?

A. That would indicate contact with the seat. Even if there was—even if it contacted above this point, or the point of the crack, there is still sufficient seat below the crack to keep the valve tight..

Q. Now you are referring to the area of brightness between the bottom of the valve and where the dull part begins, is that right?

A. That is right. Well I don't know that that was the seat before the fire, though—or the contact of that plug before the fire.

Q. Well the brightness would seem to indicate that.

A. The brightness indicates that that is where it touches now. That whole plug has been so badly burned from heat or distorted from heat, that there is other cracks in there as well.

Q. Well you notice that there is considerable irregularity in the plug; that it is worn off a great deal more in some spots than others; have you noticed that?

A. Yes, there seems to be some irregularity along the bottom there.

Q. That is an indication of wear, is it not?

A. No, sir; that was put there when the plug was ground into the seat; because this bottom face of this plug is not true surfaced with the seats; it is not concentric.

Q. Well the bottom surface does not touch anything when the valve is closed, does it?

A. No, it does not.

Q. That part goes into the hole?

A. That is right.

Q. This projection on the bottom of it, is just a sort of a guide, is it not?

A. I don't know what that was for.

Q. Now as you turn that around, can't you observe that it is a good deal more worn in some parts than others?

A. Now just what part do you mean? You mean this brightness on this plug?

Q. I am not talking about the brightness; I am talking about the shape of it.

A. Well the plug as a whole is a casting, and naturally it would be a little irregular, because it has not been turned in a lathe to make it perfectly round.

Q. But the valve, to be a good valve, should be machined to fit its seat?

A. This area of the face of the plug, from this point to the bottom, has been machined, or has been ground into that seat; machined first and then ground to fit that seat.

Mr. Underwood:

Would you say, indicating that portion of the plug which can possibly come in contact with the seat of the valve?

A. That's right.

Q. Now looking into the valve seat, what is it that this rounded surface of the valve fits against?

A. This—I don't know how to explain it; that shoulder down in the bottom of the valve with the slight angle on there, which is the seat—

Mr. Underwood:

Had you better look at them one at a time?

A. You can't get the light in there unless you get it just right.

Q. What is it that you call the seat?—the seat there? Can you indicate? There is a lot of area in there.
A. I can point to it, but I don't know how I can describe it for the reporter to get.
Q. Here is a pencil.
A. I have a pencil right here.

Mr. Underwood:
Just indicate it.
A. This shoulder, right where the point of my pencil is, can you see? That is the seat on which the plug rests or is forced down tight against, that is beveled; it is narrow and it is beveled, to fit that plug.

Q. How wide is that seat?
A. You mean, the face of it?
Q. Yes.
A. The face of that seat appears to be. I should say about three thirty-seconds; it is hard to tell; it is over a sixteenth; you can't measure it.
Q. The reason I asked you that was because I wasn't quite sure where it began and where it stopped. Do I understand that it begins at the edge and goes back up to this crease?
A. No, sir; it only begins on this point right there, and extends down into the hole. This ridge there is the ridge left by the tool that cut the seat square in the first place, to make a smooth surface to start grinding on.
Q. Well it would look to me as if the only thing that the valve seat would come in contact with would be practically the upper edge of what you call the seat; is that right?
A. No; it is ground to fit that entire angle—that corner of that seat; the corner from the top face here to the

inside of this circle here. It does not touch on the top, and it does not touch on the inside here; it touches on that angular face which is right across the corner. I can draw ~~a picture~~ of it better than I can describe it.

Q. Well that looks to me a good deal narrower than three thirty-seconds, is the thing that raises a question in my mind.

A. It might be only a sixteenth.

Q. In fact, except for the edge, it would appear to me that the hole goes down almost vertically, doesn't it?

A. It does, with the exception of that slight angular face where the plug fits to it.

Q. Well, there is only a very narrow edge that comes in contact with this valve, is there not?

A. That is right. That is correct.

Q. And whether or not gasoline would leak through this particular flaw that we have been pointing out here, would depend on whether that flaw came down to the edge or not?

A. Whether the seat touched that flaw; yes.

The Court:

Well as the valve is screwed into this, the valve seat, what finally gives it final contact, when it becomes tight, you can't screw it any further?

A. This plug is driven down into that angular seat in here.

By the Court:

Q. Well that is a curve there.

A. This is a curved surface.

Q. As it gets into the valve seat—

A. That is probably ground to the slight curve too, to fit this.

Q. That is what I was going to ask you. When this curvature comes in contact with the curvature there, and

then there is a tightness, or tightness beyond which you can't tighten it?

A. That is what determines the bottom of the valve, is the tightening of the plug.

Q. Well the natural—a glance at this valve seat would indicate as Mr. Matteson expressed it, that it was vertically straight, And that there was no rounded curvature there, to match this rounded curvature on the valve stem.

A. (Witness drawing.) That is approximately a cross-section of this valve. Of course that particular one, there is an opening goes down here, but that doesn't matter. The plug is shaped like this; the stem goes on up here. Now the only contact that there is between the plug and the seat, is this—this is the seat, with a little short angle there; and this plug comes down and contacts that; it does not rest here or on this side.

Mr. Underwood:

In other words, it doesn't rest on the horizontal surface?

A. Or the vertical surface.

Mr. Underwood:

But on the curved surface.

A. On the angular surface.

By Mr. Matteson:

Q. Just draw a line there from each end of the seat, out here, and mark it Seat; mark it Edges of Seat. (Witness marks.) Then there is simply the width of that very narrow seat that comes in contact with this rounded surface of the plug or valve; is that right?

A. That is correct.

Q. And how wide do you figure that is, from observation of the valve?

A. Say a sixteenth of an inch, or a little more. It is over a sixteenth, if you want to speak of it in that particular fraction.

Q. Well whatever the cause of it, you do see, do you not, that this valve seat is worn shiny, practically to its upper edge, on both sides of the flaw?

A. You mean the upper side of this face?

Q. Yes.

A. I wouldn't say that.

Q. Take it and look at it in various lights, and be sure.

A. The shiniest part of that seat is right at the bottom of that flaw.

Q. I am not talking about the shiniest part.

A. That is where the contact is.

Q. I take it that wherever it is shiny, there has been some contact; perhaps there has been more contact at some point to make it shinier there, but wherever it has rubbed there has been contact; is that right.

A. This other shininess can be due to handling. I would not say for a minute that that is contact of the seat.

Q. All right. Now what do you say about this valve, which shows distortion by the fire, or any effect of fire?

A. Well this plug shows very minute cracks in the plug, right through there; you see several of them.

Q. Now look the entire fixture over and show me anywhere else on the entire fixture that there are any cracks due to the fire—possibly due to the fire.

A. I can't offhand see any particular ones on the external part of this thing now. I can't get a good enough light down in there to determine any in the seat.

Q. And of course the interior of the valve is somewhat more protected than the outside of the valve?

A. What the outside of the valve looks like does not matter as long as it is tight.

Q. But what I am saying is, in the case of fire the outside would be more affected than the inside, very probably, would it not?

A. Not necessarily. That plug may be of different metal than the bowl,—the outside bowl of that valve.

Q. Now you were speaking about the connection of this valve; I think you told me that all threaded connections are tapered more or less.

A. That is correct.

Q. And for that very reason you don't expect a threaded connection to be screwed up the full length of the threads, do you?

A. Not always. That depends a great deal on the tap or the die that is being used.

Q. Well the point is that the threaded connection is used repeatedly, each time you use it you will probably be able to screw it up a little further than the last time.

A. You probably could tightened it up a little further each time.

Q. And when you come to the point where you have used up all the threads, you have used up all your possibilities of tightening it any tighter, haven't you?

A. No, sir; not until the male—or the female end has been expanded or the male end has been reduced until it is smaller than the size of the fitting.

Q. Well now take this fitting here; I refer to the fitting that screws into valve number 150; you see that that screws up the full length of the threads very readily, don't you?

A. It seems to now; yes, sir.

Q. And brings the pipe end of the fitting up against the end of the valve; is that right?

A. It seems to at this time; yes, sir.

Q. Well then after you have reached that stage, your tightness is going to depend on whether the end of your pipe fitting accurately fits against the seat of your valve; is that right?

A. You are not dependent on that; no.

Q. That, plus whatever there is in the threads?

A. Yes; if it goes up as it does now, yes. It goes up that way.

Q. Now that is not a machined fit on the end of that pipe against the valve, is it? It is just an ordinary piece of pipe sawed off, as straight as a workman could saw it?

A. No, sir; that is machined.

Q. What?

A. That is turned in a lathe, that union; the shoulder of that union is turned in a lathe—the end of it.

Q. Well do you think that the fit of the shoulder of the union against the valve proper, is an adequate connection for a gasoline pipe, when the threads have been all used up to the maximum of their capacity?

A. I would not say that as this valve and union are now, that that is a proper fit, no. I would not pass it as being a proper fit or a tight fit.

Q. On the opposite end, we have some of the threads still exposed.

A. That is correct.

Q. And that is the normal thing that you would expect, is it not?

A. Yes.

Q. That shows that you have still got some of your tapered threads to use up for the purpose of getting tightness?

A. That's right.

Q. That is what is lacking on the other end?

A. At the present time it lacks that; yes. I don't know that that is the condition that has always been in there.

Q. Of course. Now the same thing, referring now to Exhibit Number Two, the same thing exists as it is at present of course, with respect to this union that is adjacent to the valve and the Tee, that I was calling attention to on the oher exhibit. In other words, the threads going into the union have been entirely—passed entirely into the union; is that right?

A. Yes, they have in this case; yes, they have passed in there.

Mr. Underwood:

I am sorry I didn't hear that; do you mind if I ask that that be read? (The last question and answer were read by the reporter.)

Q. In other words, they have gone in and exerted their maximum of wedging effect, due to the taper?

A. They have not exerted their maximum wedging effect, no.

Q. Why do you say that?

A. That fitting could still be set up tighter, and still be perfectly tight. I say that because there is still room for the pipe, or the male end, to be driven down into the female end, whether there is any threads on it or not; there is still threads in contact with each other.

Q. Well let's take just this end, which I take it is the male end.

A. Well this happens to be the male end of the union; yes.

Q. Now all I am talking about is the threaded connection which connects the pipe with the male end of the union; that has gone in as far as it can go, hasn't it?

A. No, it has not; it can still go further.

Q. Why do you say that?

A. Because there is nothing inside here to prevent the pipe from continuing right on out through here. You could have this pipe extending out here, with the exception of not being able to make a joint at this point; but if it wasn't for that, you could continue on through, it could go there another nearly a quarter of an inch.

Q. But to begin with, you would have to have some threads on the inside for it to run through.

A. There are threads in there; you don't have to have threads in here, no; it would compress the point to that point and still be tight, because there are threads further back in here; there is threads on the pipe.

Mr. Underwood:

The female part?

A. In the female part, the threads are in there.

Q. Well of course the pipe is thicker before it is threaded than it is after it is threaded; threading takes some off it, doesn't it?

A. It takes some off.

Q. So after you got to the point where you were forcing the part of the pipe that had no threads, into the male end, you would have an exaggerated wedging effect, would you not?

A. It would still be a wedge; it would be exaggerated, yes.

Q. Well that has gone in a lot further than is normal, hasn't it?

A. That is about normal. You can't tell from—you could not tell from the lack of threads on the outside whether that is an improper thread or not, because in a great many cases pipe varies in size. A thread or die is standard, and sometimes the pipe is larger, which would show more threads out here; or if the pipe was smaller it would show less threads.

Q. Well do you say there is room, looking down into the male end of this union, for that pipe to come right on through?

A. There is. That is the end of that shoulder that is shown inside there, is the end of the brass pipe.

Q. The end of the brass pipe; you don't see all of the brass pipe through that hole?

A. No, you only see the end of it.

Q. You don't see all of the end of it, do you?

A. Yes, I see all of the end of it.

Q. You say you see the full thickness of the pipe through that?

A. No, because some of it has been taken off by the die when the thread was cut; the end of the pipe would naturally not show as much thickness as the pipe furthe back.

Q. Well let me get at it this way. Whenever you screw a threaded connection, with a fitting such as this, you have that wedging effect, due to the taper, don't you?

A. That's correct.

Q. And if the fixture isn't strong enough to take it, after you have wedged it to a certain extent you will expend it or crack it, just like you did the fitting on the gasoline tank when you made the test; isn't that right?

A. Yes, sir.

Q. I will ask you to look at the pipe end of this fitting and tell me whether it ~~isn't~~ a fact that the male end of the fitting has been forced apart and expanded out of its normal shape by the wedging effect of screwing the pipe in.

A. I can't say offhand that it has; it doesn't look to me like it has. It might show with a pair of calipers or a micromoter, but to the visual eye it is not.

Q. Can't you see it quite readily by looking at the width of the crack right around the pipe, where the pipe goes into the fixture?

A. I know, but the pipe may not have been the full size to start with—a standard pipe.

Q. You say the pipes didn't fit?

A. The pipes could still fit, and not be standard size. One manufacturer makes his pipe one size, and another makes it a little bit smaller, and it would still fit, still make a tight joint.

Q. You say that this may have fitted, in spite of the indications that I have called your attention to, that might indicate that it wouldn't fit? Is that right?

A. I still—I say that that is a tight fit.

Q. Your opinion is that it is a tight fit?

A. Well yes; you can call it my opinion.

Q. And when you spoke of screwing down against the female end, what you meant was that this pipe might still have been screwed into the male end up to the point where it would come out, and prevent contact of the male end with the female end, is that it?

A. Of the union, yes.

Q. Of the union.

A. And still make a tight joint.

Q. I guess I understand that. It is true that threaded connections in brass pipe occasionally work loose through vibration, and leak; and have to be tightened up; isn't that correct?

A. An improperly installed line might loosen up, yes; and there is a great many things that would cause it. I mean—

Q. Even reasonably well installed, brass pipe connections used for carrying gasoline might occasionally require tightening, might they not?

A. Any pipe might require tightening up.

Q. Yes, and that is especially true in the engine room of a boat where there is always a greater or less degree of vibration; that is true, is it not?

A. It depends entirely—yes; strike out. There would be more tendency to vibration in the engine room than any other part of the boat, yes.

Q. And vibration may cause loosened connections?

A. It could, under certain conditions, yes.

Q. And for that reason it is desirable to have as few connections as possible, is it not?

A. The fewer threaded joints you have, the less liability there is of any of them vibrating loose.

Q. A potential hazard you have from that source?

A. Yes, you can't always do away though with all of them that you would like to. It would be better if you only had one piece all the way.

Q. And you would have that, if you used copper pipe instead of brass pipe, wouldn't you?

A. You would have one continuous piece, yes; but you still have other hazards.

Q. About this glass gauge that was in the engine room; I understand you to say that you discovered what you thought was the fitting of that glass gauge?

A. I did.

Q. Have you got that?

A. No, sir.

Q. Where is it now?

A. It is aboard the vessel.

Q. Can you make a sketch of what it looks like?—

Mr. Matteson:

Before we go farther, I would like to mark this sketch of the valve seat; I will ask to have that marked as an exhibit now.

A. I can show you a picture of one of those such valves in the catalog I have here, if that would—of this connection. You asked me to draw a picture of it.

Mr. Underwood:

Let's get that one marked.

(The sketch so tendered was marked Libelants' Exhibit #123 for identification.)

Q. Suppose you show me the picture of the fitting in the catalog, if you don't mind.

Mr. Underwood:
Is that for identification or in evidence?

Mr. Matteson:
In evidence.

Mr. Underwood:
That is out of the regular routine. It doesn't make any difference to me, but our rule from away back in March was that you can't offer anything except for identification.

Mr. Matteson:
That is perfectly satisfactory; I offer it for identification now.

A. I don't want to lose this book. That is a similar type, I believe; the one I saw out there I think has a metal handle on it like this, but that one I believe shows a wooden handle.

Q. I think it would be better for you to draw a little sketch of it. ~~You can~~ use that for a model if you like. I think you said that end—

Mr. Underwood:
Before we go further, may I describe the illustration which he indicated. It is the illustration on the left of page 209 of Jenkins Valves and Mechanical Rubber Goods Catalog #23, Copyright 1933 by Jenkins Bros.

Mr. Matteson:
All right.

A. You want this in a cross-section, or do you want it just—

Q. In a cross-section.

A. To describe that valve, it is merely an angled valve with a fitting on one end to screw into a tank or a pipe fitting, and on the other merely a connection to take the glass tube, with a packing nut on it. That is about as simple, I think, a description of it as even a drawing would be.

The Court:

Let's see the picture you pointed to.

A. It is a standard angle valve.

Q. Perhaps I can—

A. Not that I don't want to draw a picture of it, but it takes time.

Q. Perhaps you are right; perhaps we can do it by a few questions.

Mr. Botts:

If your Honor please, Mr. Matteson tells me he will be on this witness until five o'clock, and I would like to get over to the office just a minute, so if I may be excused—?

The Court:

Yes, sir; that is all right.

Mr. Botts:

Because I have some cross examination of this witness.

Q. I think it has been described, that this gauge came out of a Tee on the gasoline line; is that your understanding?

A. My understanding was that it came out of the Tee in the manifold.

Q. And that would be a vertical Tee?

A. That I couldn't—no, I would say it would be a horizontal tee.

Q. And what sort of a fitting would there be on that?

A. The lower valve of the side gauge would be screwed directly into that tee, as I gather it. It could be—now it may not have been.

Q. You have called attention to a gauge in this catalog, which I gather is about twelve or fifteen inhes high. This gauge that has been described, in the Seminole, as I understand it, ran the whole height of the tanks. In other words the tee would have to support a great deal more, as I understand it, than would appear in this illustration, would it not, in the way of weight?

A. If your tube ran continuously all the way to the top, it would have to support more than this as shown; there is no dimensions on that sketch there.

Q. Of course you don't know whether it was a standard gauge fitting such as is shown here, or not, do you?

A. It was a standard gauge valve.

Q. Just what was the object that you say you saw in the Seminole—you found in the Seminole, that you thought was the gauge?

A. The object that I saw was only the valve, as attached to a length of pipe as it came out of a tee; as I recall it came out of a tee, and there was five feet of pipe or more attached to ~~it~~—the sides.

Q. Where did you notice that in the wreck of the Seminole?

A. That is in the engine room in all that pile of debris. There was the remains of another one laying on top of the auxiliary generating plant, forward into the engine room. Whether it came off of that, or whether it came off of the water tanks—pump, down in the lower or right hand, starboard—forward starboard corner, or not, I don't know.

Q. When was it that you observed that?

A. I don't remember; it has been some time ago.

Q. Well this gauge has been described as being fitted within a brass pipe.

A. I believe that was one of the descriptions of it; yes, sir.

Q. If that were so, how would the brass pipe be supported?

A. I would assume that the brass pipe would merely rest on the packing nut of the valve.

Q. Without any fastening?

A. Without any fastening; it wouldn't need any fastening.

Q. If it wasn't fastened, it wouldn't be much protection, would it?

A. Oh yes.

Q. Have you any information as to how this gasoline gauge was fitted to the top?

A. I haven't any direct—no. I assume that there was another valve of the same type at the top. That is the standard practice of installation.

Q. That would be the standard practice?

A. That is the standard practice of installation.

Q. And where would it be connected at the top? Back of the tank?

A. It could be connected to the filler pipe or to the vent pipe, either one, any pipe above that. It doesn't seem to have been connected with the vent pipe, because there is no indication of the tee connection in it.

Q. Now of course if it wasn't connected with the vent pipe or the filler pipe, it would have to have a vent at the top, or it would be useless, wouldn't it?

A. It would.

Q. And would you approve a gasoline gauge with a vent at the top?

A. Open vent? No, I don't believe that would be—

Q. That would be a dangerous thing, would it not?

A. I wouldn't consider it as proper, unless it extended above the deck, or led overboard, or something of that nature.

Q. The glass gauge as described in this catalog that you refer to, is a steam gauge, is it not?

A. That is a steam gauge; yes, sir.

Q. And a steam gauge would be somewhere around twelve or fifteen inches long, would it not?

A. Might be longer. I have bought them up to three feet. I know that they can be gotten on special order, longer than that; you can get them any length you want; get them six inches long.

Q. I am not talking about what you can get; I am talking about the height of the ordinary gauge on a steam boiler; it wouldn't ordinarily be over fifteen to eighteen inches, would it?

A. Well I am not familiar with steam engines so I don't know. It seems to me I have seen them on boilers, longer than that—stationary boilers, upright boilers.

Q. Now in this case the glass gauge must have been six feet or more high, judging from the height of the tanks; is that correct?

A. That's correct, if it was in one piece. It didn't have to be in one piece.

Q. That would be pretty unusual height for any kind of a glass gauge, would it not?

A. I would think it would be rather a long glass tube. I wouldn't personally install one as long as that.

Q. Now let me ask you this. You say you have examined a number of vessels for purpose of insurance. Have you ever recommended a vessel for the purpose of insurance, that had a glass gauge for determining the height of gasoline in the tanks?

A. I have never turned one down.

Q. Have you recommended one that had one?

A. I can't say that I directly recommended them, because I don't make any recommendations whatsoever, un-

less there is something that I don't approve of, that I make a recommendation that it be changed. Now I did not recommend the gauge, because I made no mention of it; it was there, they could use their own conclusions.

Q. Do I understand that with respect to one or more vessels, that you did make a report mentioning the gauge, one way or the other?

A. I have never made one; no; because none of the vessels I have ever surveyed have had any such gauge as that.

Q. Now let me ask you about the draw-off valve. Have you ever made a report for insurance purposes, with respect to a vessel which had a valve in her engine room for drawing off gasoline?

A. No, I haven't.

Q. Never had occasion to make a report?

A. I never had occasion to make a report on a vessel that had.

Q. You were saying that it was important to have a supply of gasoline available in the engine room, for certain purposes. It would be a very simple matter to have a separate tank on deck, in the vicinity of the engine room, for storage of gasoline that the engineer might want to draw off for any purpose, would it not?

A. You could have a tank on deck, yes; it would be handy.

Q. You have seen such auxiliary tanks on deck, have you not?

A. I have seen auxiliary tanks on deck; yes, sir.

Q. And if you had such tank, there would be no necessity of having a draw-off valve in the engine room, would there?

A. Yes, there would, in this condition, under the circumstances of this installation, it would be.

Q. Why would that be?

A. Because you need a supply of gasoline where it can be gotten at readily without having to go on deck to get it.

Q. For what purpose?

A. For priming the motors.

Q. Would you approve—would you say that it was proper for an engineer to draw off gasoline for any purpose, from any connection in an engine room, while the motors were running or hot?

A. I see no reason why it shouldn't be done?

Q. The drawing off of gasoline from any connection creates fumes, does it not?

A. That is correct.

Q. Those fumes are highly inflammable and dangerous, are they not?

A. So I am told.

Q. You haven't any doubt about it, have you?

A. No, I don't think I have a doubt about it.

Q. If you have your engines, or one of them, running, you have a danger of sparks in the engine room, do you not?

A. No, not in a properly installed motor, you would not have a tendency to sparks.

Q You have auxiliary machinery that is liable to create sparks, do you not?

A. You might get some from the generator.

Q. A spark would cause a gasoline explosion if the gasoline fumes were near it, would it not?

A. It might, yes.

Q. Well, I take it that what you have in mind is that gasoline might be needed for priming; is that right?

A. That is correct.

Q. And that is the only reason you have in mind that gasoline might need to be available in the engine room, is that right?

A. Free gas, that's the only reason I see for having free gas in the engine room.

Q. Wouldn't it be quite possible to have squirt cans of appropriate capacity, with proper caps to them, so there would be no danger of gasoline escaping from them in the engine room, where they would be readily available for such service?

A. You use a squirt can for priming a motor.

Q. And you could have it properly filled and kept in the engine room and available for that purpose, couldn't you?

A. You could, and you do; but those squirt cans have to be refilled ever so often.

Q. And if you had them filled in the engine room and ready for use, in emergency you would have them, wouldn't you?

A. That is true.

Q. And if you wanted to refill them, you could go out on deck, where the auxiliary tank was, and refill them where there would be no danger from refilling, couldn't you?

A. You could if you had time enough between the first priming and the second priming. Sometimes it is not convenient, in a case of necessity, or an urgent case, where they would have time to go up a hatch, out on deck, and fill up a tank with gas, and then spill it on the way down.

Q. How long would it take to prime and start a motor such as the Seminole had?

A. To start both those motors I should say it would take five minutes at least.

(Following discussion between Court and counsel as to calling of handwriting-expert witnesses, recess was taken until 9:15 o'clock a. m. of the following day, to-wit, October 11, 1939.)

3102 Thereupon MR. WIRTH MUNROE resumed the witness stand and further testified as follows upon

Cross Examination (Continued).

By Mr. Matteson:

Q. Mr. Munroe, we were talking at the close of Court yesterday, I believe, about the glass gauge in the engine room of the Seminole; and I called your attention to the fact that the testimony is that the glass gauge was the height of the tank. If that were true, it would require a fairly substantial fixture at the bottom, to hold that, with the brass pipe protecting it, wouldn't it?

A. It could be done that way; yes.

Q. Well, it would require a fairly substantial fixture to do that, would it not?

A. Yes.

Q. And of course, below the glass gauge itself there would be the packing gland first, I take it?

A. The packing gland is on top of the valve.

Q. Yes. There would be a valve and a packing gland, and then the glass; is that right?

A. That is right.

Q. How high would you estimate that the bottom of the visible portion of glass would be above the manifold line?

A. Well I don't know that the gauge went all the way to the bottom of the tank; or, do you mean, above the manifold?

Q. Yes; it was affixed to the manifold line, I take it?

A. Yes.

Q. And the bottom of the visible portion of the glass would necessarily be some distance above the manifold line itself; that is correct, isn't it?

A. Maybe three inches; something in that neighborhood.

Q. That would be your estimate, about three inches?

A. It depends on the size of the valve and the size of the glass tube; I don't know what; I don't recall; I didn't measure the size of the tube.

Q. Do you know the size of the tube?

A. No, I do not; I did not measure it.

Q. Now you were telling us yesterday that you estimated that there were sixteen gallons of gasoline in the tanks when the Seminole was laid up. Was that what you estimated?

A. I estimated that that was the amount of fluid or what was in the tank, that could not be drawn out through the outlet.

Q. Does that refer to each tank, or to all four tanks together?

A. That refers to all four tanks.

Q. Now will you tell us by what method of calculation you arrived at that result?

A. By taking the depth of the crown, the bottom.

Q. Will you give us the figures?

A. I will have to refer to my notes.

Q. All right.

A. I estimated the depth of crown two and a quarter inches.

Q. Now I am not quite sure what you mean by the depth of the crown. Perhaps you could draw us a little picture.

A. The height of the crown, you might call it; the distance between the chord and the top of the arc.

Q. Yes; that is from the bottom of the tank, to the top of the crown?

A. Not from the very bottom of the tank, no.

Q. Well, from the bottom of the inside of the tank?

A. From where the sides came in contact with the—

Q. With the bottom?

A. With the bottom.

Q. I see; and that I think you said was about—

A. Two and one quarter crown.

Q. I am getting the height of the bottom of the crown above the side of the—bottom of the side of the tank; what was it you said there about two sixteenths, or three sixteenths of an inch—was that right?

A. Somewheres around an eighth of an inch.

Q. An eighth of an inch.

A. An eight or three, sixteenths.

Q. I see; all right. And then the—

A. But that still does not—there is more distance than that up to the point of contact. I mean, there is the doubling of it.

Q. I will get this straight; then the height of the crown, or the bottom, at the center—above that point, the tank is in a vertical position; you figure it was two and three quarter inches?

A. Two and one quarter.

Q. Two and one quarter inches; all right. What is the rest of your calculation?

A. We know the diameter of the tank, which is forty-two inches.

Q. All right.

A. Instead of using the formula of the circle, I did not know the exact curvature of that top, so I assumed it as a triangle, as if it was merely—the bottom was merely a cone, and figured that amount and deducted one-third for the crown, which is what we use in rough figuring where we have a curved line.

Q. I see.

A. —or a curved surface.

Q. All right. Now what is the rest of your calculation?

A. Well that gives me my volume.

Q. Then that will give you the volume of the tank, as I understand it?

A. Volume of that lower part of it.

Q. The lower part of the tank. If it was filled so it just came to the top of the crown?

A. That is correct.

Q. And will you just give us the figures for that calculation?

A. I have here the total computed gallons, as 6.747 in one tank; that's without the deduction of the crown.

Q. What I want to get at, is the step; how do you get the 6,747?

A. By merely figuring the volume of that cone.

Q. Yes, but how do you figure the volume? Give me the details of your calculation.

A. Well, I haven't got them here; I only put down the results of them here. That's a simple computation; any school child can figure that one out. You have got a triangle, a known base, and area.

Q. All right.

A. And a circle.

Q. What do you say was the volume of one of these tanks per vertical inch, outside, above the crown?

A. I don't know; I didn't figure that. I have a table here in Kent's that will give it to me exactly.

Q. What did you figure it?

A. I figured it per foot. The table that I used happens to give it in feet; the volume for a known diameter, in feet.

Q. Can you give us the volume per foot for a forty-two inch tank?

A. I will have to look in Kent for it; I have forgotten what page the tables are, now. I can't locate my table as quickly as I would like to. The number of gallons in a one-foot column of a 42-inch circle, would be 71.97 gallons.

Q. 71.97?

A. Per foot. Here is your diameter in inches. U. S. gallons.

Q. 71.97.

Mr. Underwood:

Referring to table 31 on page 95 in Kent's Handbook of—Mechanical Engineers' Handbook.

A. Edition number ten; 10th edition.

Mr. Underwood:

Edition 1923.

Q. Well, that would be approximately six gallons per inch, is that right?

A. Roughly, yes.

Q. Now as I understand it, in order to get this result that you have given us, you multiply six gallons per inch by two and one quarter?

A. No, I didn't.

Q. Well tell me what you did, then.

A. I figured a triangle, the base of 42 inches in diameter—it is not a triangle, it is part of a cone; offhand I can't just describe the exact form.

Q. As if it were a cone instead of a dome, is that it?

A. It is the reverse of a cone.

Q. Well, you figure the height of that cone to be two and a quarter inches?

A. That is correct, with a base of 42 inches.

Q. And after you figured—

A. That is the base, not of 42 inches, but the area of a base—a circular base 42 inches.

Q. You figured the cubical contents of a cone whose base was a circle 42 inches in diameter, and whose height was two and a quarter inches?

A. I believe that is right; I am not sure. I know how I did it, but I don't know whether you are—I used the area of a circle 42 inches in diameter, as a base, with a height of—figuring on a triangle, as a triangle, two and one quarter inches in altitude.

Q. Well then after you got through doing that, what did you do?

A. That gave me a result in cubic inches.

Q. Yes?

A. And that divided by 231, which is the number of cubic inches in a U. S. gallon, gives me the gallonage of that.

Q. Yes. Well we might—I want to suggest that we might figure it another way, and see what you say to this. If you take the cubical—the capacity in gallons, of a circular tank 42 inches in diameter, and two and a quarter inches high, isn't there a coefficient that you could apply for a reduction of that volume to compensate for the crown?

A. There are other ways of arriving at the same volume, by going at it in a different way; I admit that.

Q. Well, that would be one method of getting at it, would it not?

A. 'I believe that would give you—I wouldn't say that it is absolute, without figuring it out.

Q. Now in any event, what you have given us, the figure of 6.747, is the volume of liquid you figure would be in any one tank if it was filled just to the height of the center of the crown?

A. Yes, sir; that is what I figured.

Q. And that would be two and one quarter, plus one-eighth inches above the bottom of the side of the tank?

A. No, it would be more than that, because you have the doubling of the side of your bottom, and the sides of your tank, where the doubling comes, where your rivets go through; you can't include that part of it.

Q. Well I am just trying to figure, what the level in the tank is, outside of your calculation; you have just told me that you figured—that your figure represents the volume of liquid in the tank, if the tank is filled just to the height of the top of the crown?

A. That is right.

Q. That is right. Now, the height of the top of the crown is two and a quarter inches above this lower edge?

A. It is not the lower edge of the tank, no. It is the distance between where the crown of the bottom starts from the side, if you understand what I mean.

Q. How far is that above the bottom?

A. I don't know what that distance is at the bottom, offhand.

Q. You can't tell us that?

A. I can't tell you that, because I didn't measure it. I did measure in some place; I haven't got that on this particular piece of paper. I measured with a straight-edge across the bottom of the tank, measuring to the total crown and then deducting from that the distance from the bottom edge of the side of the tank, to the point where the crown of the bottom starts, above the rivets.

Q. I see.

A. I only figured from that point up.

Q. But you took a straight-edge across the bottom of the tank, measured up from the center of the bottom up to the top of the crown; do you know what that measurement is?

A. I don't recall what my measurement was; no.

Q. Well your calculation of the quantity in each tank, which you have told me is enough to fill the tank to the top of the crown—?

A. Yes, sir.

Q. Assumes that the top of the crown is level with the outlet of the tank, doesn't it?

A. Yes, sir; because I measured those two to see if they were the same, and they were near enough for my estimate. They may have varied a fraction of an inch, but they were near enough for my estimate.

Q. What was the height of the center of the outlet fixture as installed on these tanks, above the bottom edge of the tank?

A. Four and three quarter inches, I believe.

Q. Four and three quarter inches?

A. I measured that; I have got it here I believe; four and three quarter inches.

Q. That is right. Now—

A. That is to the center of the hole. Now you can figure the bottom of the hole, for the outlet.

Q. That is right. Now you told us there was 6.747 gallons in each tank; is that right?

A. That's before—that's providing there is a triangle in there, that the bottom crown is a straight line and not a curve.

Q. There were four tanks, were there not?

A. There were four tanks.

Q. Well then the full capacity ought to be four times whatever the result is for one tank?

A. That would be 26.988.

Q. Well wasn't the estimate that you gave us in the first place, sixteen?

A. Yes. From that figure of 26.988 I deducted one-third for the curvature of the bottom; which is only rough, it is not absolutely correct.

Q. Well you had already deducted that.

A. No, I hadn't.

Q. In the 6.747, had you not?

A. No, I did not. I tried to explain that the volume of 6.747 was using the crown of the bottom as a straight line, or the end of the bottom being a cone, coming to a point in the center.

Q. Well your calculations I take it—

A. I merely deducted my third after I had arrived at the total figure. Just a matter of where you deduct it, whether you take it at the end or the beginning.

Q. It doesnt' make any difference where you deduct it, if you assume that the level that you are calculating is no higher than the bottom of the middle of the crown of the tank?

A. That is correct.

Q. Of course if it is higher, then it does make a difference?

A. It makes a small difference, yes. If the crown was higher than the outlet, the bottom of the outlet, it would be less gasoline.

Q. Were you assuming that the gasoline in the tanks was no higher than the bottom edge of the outlet of the tank?

A. In normal position, as the—whatever the fluid in your tank, as it flowed out through the outlet, it would drop to the bottom of that outlet.

Q. What was the width of that outlet?

A. I believe it was a three-eighths; it is more than three eighths. It was a standard three eighths pipe, which is larger than three eighths.

Q. The diameter of the hole would be three eighths?

A. The diameter of the hole is more than three eighths; yes.

Q. Now you have told us that—you measured the distance from the center of the outlet of the tank to the bottom of the tank, as four and three quarter inches?

A. The center of the outlet, yes, to the bottom edge of the tank.

Q. And you measured the distance from the bottom of the pan to the bottom of the groove in which the tank sat, did you? Or at least you confirmed your measurement of that, did you not?

A. I confirmed your measurement out there the other day, the depth of the groove; I don't remember the other.

Q. Well wasn't it—didn't we ascertain at that time that it was two and three quarter inches from the bottom of the pan to the bottom of the groove?

A. Yes, we did; you are right; I have it here.

Mr. Underwood:

Is that two and three quarters?

Mr. Matteson:

Two and three quarters.

Q. And I think that we confirmed, did we not, that the height of the top of the engine room floor, from the plate at the bottom of the ship, was nineteen inches? Was that correct?

A. ~~The bottom of—the top of that opening—~~

Q. No; I am going down to the bottom plating of the ship on the inside now, through the top of the engine room floor. What measurement have we for that?

A. I have seventeen and a half inches from the keel plate to the top of the engine room floor.

Q. Seventeen and one-half inches. Then from the top of the floor to the center of the opening through which the outlet valves of the tanks came—

A. Yes.

Q. What measurements have we for that?

A. Twenty eight inches.

Q. Twenty eight inches. So that would put the center—

Mr. Underwood:

Excuse me; may I interrupt and get that? Read me the last question and answer, please.

(Preceding three Questions and two Answers, read.)

Q. So that will put the center of the opening through which the outlet from the tanks came, a total of forty five and one half inches above the bottom plating of the ship, would it not?

A. That is correct.

Q. Did you measure the opening from the engine room into the space under the tank compartment? Have you some measurement for that?

A. I have those measurements; I didn't actually measure them.

Q. What measurement have you for that?

A. The opening is nineteen inches high, twenty-one inches wide, with the exception of that angle which is in the opening.

Q. How much is that narrower?

A. It narrows it down to fourteen inches. Whether that is the original position of that angle or not, I do not know.

Q. Now while we are on the subject of measurements, have you some measurement for the size of the opening in the steel bulkhead between the engine room and the starboard passageway which took the windows?

A. I haven't got them right here, but they were taken. I haven't got them.

Q. And you haven't the height of the bottom of that opening above the floor?

A. I haven't it in any of my notes. I believe Mr. Underwood has that.

Mr. Underwood:

This is the window in the alleyway between the engine room and the aft bulkhead; Mr. Munroe measured them and I wrote it down; if you want them you can have them.

Mr. Matteson:

Have you got them?

Mr. Underwood:

Yes; do you want them?

Mr. Matteson:

Yes.

Mr. Underwood:

The width of the opening is two feet three and a half inches; the height of it is three feet one and a half inches. It is three feet eight inches above the floor frame.

Mr. Matteson:

And have you got how far down from the ceiling?

Mr. Underwood:

No, I haven't that.

Mr. Botts:

About six inches.

Mr. Underwood:

Approximately that. I remember that, but I didn't put the ruler on it.

Q. Now this opening, the measurements of which we have just put in the record, representing the opening in the steel bulkhead which took the window into the alleyway, of course that was merely an opening cut into the steel bulkhead, was it not?

A. That is right, with a frame inside of that.

Q. There would necessarily have been a frame inside of that, which would have reduced the size of the window about two inches on each side?

A. Not necessarily; it might not over three inches altogether; an inch and a half on each side. It might have been a little more for the thickness of the sill; the sill may have been a little bit thicker than the rest of it.

Q. You would estimate an inch and a half for the sides, and say about two inches for the top and bottom?

A. It may have been more than that. There would be no necessity of making it much heavier frame than that.

Q. Now in the first place I want to describe to you a drain line, which I believe that Captain Baker said was in the pans under the tanks; the starboard pan under the tanks; consisting of a pipe which led from the starboard forward corner down to the floor beams of the vessel, forward to the base under the bathroom on the starboard side of the ship, forward of the tank compartment, and up and joining into the side of the outlet of the toilet discharge, which is said to be a few inches below the water level,—below the water line at the side of the vessel; in which the water would flow back from that overboard discharge until it stood in the pipes to the height of the outside water level of the vessel. Would you consider that a proper drain?

A. It would be a proper drain, providing the pans were above the water line.

Q. Well you mean, a proper drain for draining gasoline outboard?

A. It wouldn't be the best. It would take care of the job, but it wouldn't be the very best.

Q. Now under the conditions that I have described, you understand that the lower part of the pipe, the uprights, up to the water level, would be filled with water?

A. The pipes would be filled—in that pipe the water would be the same height as it would on the outside of the vessel, yes.

Q. And gasoline floats on water, does it not?

A. It does.

Q. And consequently, if any gasoline ran from the drip pan into the discharge pipe, it would float above whatever water was in that pipe, would it not?

A. To a small extent, yes.

Q. Well it would not be heavy enough to force itself or the water out of the pipe, would it?

A. It would if you had enough head on it.

Q. If you had enough head on it?

A. Yes.

Q. It would take quite a little head on it, wouldn't it?

A. Not a great deal.

Q. How many inches?

A. A couple of inches, higher than the pipe, for it to force its way down.

Q. Well let me see if I get this right. You mean that if gasoline ran out of the tank, out of the pan into the pipe, so that it filled the pipe to a level of two inches above the water, what do you say would happen?

A. That it would gradually work out into the other,—into the water below it, providing the outlet is not too far down.

Q. Do gasoline and water mix?

A. Yes they do to a certain extent; form an emulsion.

Q. Is that what you are assuming would happen there?

A. It would, with agitation,—there could be an emulsion formed, yes.

Q. Well isn't it a fact that gasoline would necessarily float on the water in that drain pipe line?

A. It would float to a certain extent, but after there was enough on the surface it would force its way down, it would force the water out after a while, providing there was not too much volume of water below it.

Q. Well I am assuming that the pipe is filled and runs down to the bottom of the vessel, runs forward and is filled up to the point of the overboard discharge.

A. Well I don't know that it did run down and then back up again.

Q. I am just asking you to assume that.

A. That is a different problem.

Q. That is the problem I thought I put in the first place.

A. I am sorry, I didn't understand that there was a trap in there, or a reverse siphon.

Q. If there was a trap in there, as you call it, it would not serve the purpose of a gasoline drain line at all, would it?

A. No it would not. I am sorry I didn't understand your question before, but with the reverse siphon it wouldn't be as satisfactory.

Q. Wouldn't be as satisfactory?

A. No.

Q. Wouldn't be satisfactory at all, would it?

A. It could work under the conditions; I know the reason why it would work.

Q. Well, tell us.

A. There is a condition that hasn't been brought into the thing, and that is the fact that it discharged into a toilet connection, where there was constant flow,—not constant, but frequent flow of water past that, which would have a tendency to suck any other water,—any other pipe leading into it.

Q. It wouldn't suck the water out, would it?

A. It would suck the water from the small pipe, through.

Q. It would always,—the pipe would always be filled with some water, would it not?

A. It would always be filled, but every time that water passed through the larger pipe from the toilet, it would have a tendency to draw from the smaller pipe, any water that was in that, as you flush it, due to the flow.

Q. Would you pass such a pipe as a proper drain pipe?

A. Not with the inverted siphon in it, no.

Q. Now in the second place, did you find any evidence of any pipe that could be used as a drain pipe, on the starboard side of the pan?

A. Not on the starboard side of the pan.

Q. There was none there?

A. No.

Q. Now isn't it a fact, for a drain line to be a satisfactory line for that purpose, it would have to lead from the receptacle to the drain in a continuous down grade, to a point outside the hull of the vessel, above the water line?

A. To be a perfect one, yes.

Q. And if it was arranged in such a way that the water would flow back through it, that would interfere with its function as a drain?

A. Such a drain, running on a gradual grade, or constant grade, running to the outside of the vessel, when that vessel was under way, water was passing by her side, past the opening of that pipe, there would be a suction cut of that pipe continuously, pulling any liquid that was in the pipe, out, regardless of how high or how far below the water line it would be.

Q. And if the vessel was at rest and the line, outlet of the line, was below the water level, the water would always stand in the line to the level of the water outside?

A. It would, yes.

Q. And if the vessel listed to that side, it would increase the height of the water in such a pipe?

A. That depends on how far the pipe is from the side of the vessel, where the rise would be; how high the upper end of it is.

Q. It would cause a rise because the water level on that side would rise?

A. If it should come nearer the center of the vessel, there would be no rise. If the upper end of the pipe was near the center of the vessel, or point of roll, center of gravity, pivot point of roll, there would be no movement or rise and fall in the pipe, whatsoever.

Q. I think you said in your direct examination that drains in the drip pans would not be necessary if the pans did not leak; is that right?

Mr. Underwood:

If the tanks did not leak?

Q. If the tanks did not leak, of course there would not be any necessity of drip pans either, if the pans did not leak, would there?

A. There wouldn't.

Q. You were saying yesterday that there was no need for access to the tank compartment for the purpose of inspection of the tanks; is that right?

A. No absolute need, no.

Q. What do you mean by absolute need?

A. I mean that those tanks could be used for many years without having any outside inspection.

Q. I see. You don't think it is necessary, with respect to a gasoline tank, to have it under continuous observation by a careful engineer?

A. No it is not necessary. You will have a leak just the same, you might have a leak, I mean, regardless of inspection.

Q. But if you have an inspection then you know about it, don't you?

A. Not necessarily. A leak could occur between inspections and you would not have seen it at all.

Q. Well you will admit that a leak that you can't discover is a much more serious matter than one that there is some possibility of discovering?

A. Well it is sometimes nicer to know, you maybe put your mind at better rest, if you think you can see the outside of the thing.

Q. And if you know, then you can avoid known things until the defect is remedied of course?

A. Yes. But there is no reason why those tanks should have leaked though so there was no need for inspection.

Q. I think you said that there was no need, because you could apply a hydrostatic test?

A. That is correct.

Q. Is that the reason why you say it is not necessary to have access?

A. That is a reason, yes. ~~You can~~ test them beyond the service point of your tank.

Q. Now a hydrostatic test is quite an intricate matter, is it not? Takes a lot of time and a lot of arrangement?

A. I don't know; it is one of the simplest tests I know.

Q. Well if you had a boat like the Semniole, you wanted to apply a hydrostatic test to her tanks, you would have to first of all remove the gasoline from them, would you not?

A. Not necessarily, no.

Q. At least you would certainly want to remove it?

A. You could run your hydrostatic test with gas in them if you wanted to.

Q. Did you ever hear of running a hydrostatic test with gasoline?

A. No, but you could use any fluid. Hydro does not necessarily mean water.

Q. Well if you used water, water is the normal thing to use for the hydrostatic test, isn't it?

A. That is correct.

Q. And if you used water you would want to get all the gasoline out of the tanks before you put water in, would you not?

A. Not necessarily, no.

Q. If you had your tanks half full of gasoline, you say you would just fill them up the rest of the way with water, and hold your test that way?

A. Float your gasoline on top of your water, if you wanted to. It is possible to do that. I don't say that that—

Q. That would be—

A. The way everyone would do it.

Q. That would be just about throwing away so much gasoline, wouldn't it?

A. Not at all. All modern gas tanks are stored in underground tanks and pumped out by forcing water into the tanks.

Q. Well hydrostatic test of tanks is the test that is made periodically, at considerable intervals; is that not a fact?

Mr. Underwood:

I object to the question unless further facts are included; what tanks, and what type of vessels, and by whom.

Q. I am talking about any kind of a hydrostatic test of a tank on a vessel. As a matter of fact it is not practical to make such tests at frequent intervals?

A. You say it is not practical to make them?

Q. Yes.

A. No I do not know that it is impractical. Maybe I misunderstood your word.

Q. Have you ever conducted a hydrostatic test on a vessel?

A. Not on the vessel itself, no.

Q. Have you ever conducted any other hydrostatic test than the one you described to us the other day?

A. I have, on other tanks.

Q. What sort of tanks?

A. Gasoline tanks.

Q. What size?

A. And water tanks, both.

Q. What size?

A. They were small tanks, fifty to sixty gallons apiece; not round, they were angular tanks.

Q. Would you say it was a practical matter, relying on hydrostatic tests as a matter of keeping the tanks, the gasoline tanks of the Seminole, under sufficient inspection, year in and year out?

A. If you want to go to the trouble of making hydrostatic tests, yes, I would say one test a year would be quite sufficient. Very few of them are ever made, though.

Q. Then your idea would be to have a hydrostatic test once a year, and no other means of observation of the tanks in between.

A. Well there were pans underneath there, and if there was any leak in the tanks it would certainly show up in the pans. You wouldn't be able to readily determine just which tank it was, though; that would mean going to a yard and having the tanks removed, which would be the safest thing to do.

Q. Now do you approve the placing of wooden stringers in the bottom of a drip pan under a gasoline tank for the purpose of supporting the tank?

A. I certainly do.

Q. And if there were a leak in any of those gasoline tanks resting on those wooden stringers, it is a fact, is it not, that the leak would be absorbed by the wood and run off in the form of vapor?

A. It would, yes; but there is other things to consider besides that.

Q. Do you consider that that would not be a hazard which should be avoided?

A. That is the lesser hazard; what you refer to by not using wood.

Q. Do you know any set of standard rules of practice with respect to vessels of any class, that permits the use of wood fixtures in a tank compartment?

A. I am not familiar enough with any of them, to know. I have never seen anything else but wood cradles put in tank compartments—or cushions under tanks.

Q. Do you know that that practice is forbidden by Lloyd's rules with respect to yachts? Do you know?

A. I do not know it. I know that that is the common practice in this vicinity.

Q. What are Lloyd's rules for yachts?

A. Lloyd's rules are made up, as I understand it, solely for insurance purposes. They will insure a yacht that is made up by Lloyd's quicker than they will without them.

Q. Who are *they?*

A. Beg pardon?

Q. Who are "they"?

A. The insurance companies.

Q. Isn't it a fact—

A. Lloyd's is merely a brokers'—brokerage of many insurance men; central brokerage house.

Q. It is your idea that Lloyd's Classification Society is an insurance brokerage?

A. No; Lloyd's—I won't say that that particular one is. You mean the one that compiles these rules?

Q. Yes.

A. No; that is a society very similar to our American Society of Naval Architects, or American Society of Marine Engineers, or Automotive Engineers, or any others, that establish a standard. That standard may not always be practiced in every view.

Q. Such standards as are established by such organizations, are recognized as standards of careful and prudent practice, are they not?

A. Lloyd's is considered a good practice, yes, for ocean-going vessels.

(Informal recess was had, 3:36-3:43 p. m.)

Q. I take it, Mr. Munroe, that the objection you have to Lloyd's rules with respect to yachts, of which we have copies here, marked 101, 101-A, as applied to the Seminole, is that such rules apply only to seagoing vessels; is that right?

A. Practically yes. You may build a boat to Lloyd's rules that isn't seagoing; but it is primarily for seagoing vessels.

Q. Do you think that makes any rule with respect to wood in tank compartments, inapplicable to a vessel of the type of the Seminole?

A. I don't quite understand your question.

Mr. Matteson:

Will you read it? (Question read by reporter.)

A. I don't say that it is necessary to follow those rules exactly; that it has any bearing on what was done in here.

Q. I think you said that you knew of no other way of fastening the tanks, in the tank compartment, other than by wood bracing; is that right?

A. If I said that I certainly didn't mean it. There are other methods of fastening, without wood bracing; yes.

Q. And they could be fastened by steel straps to the bulkhead?

A. By steel straps, yes.

Q. These tanks were not fastened by steel straps to the bulkhead, were they?

A. As far as I can see, they weren't.

Q. Did you measure the diameter of the holes in the bulkhead through which the fixtures from the tank came? —I mean the outlet valves and the filling lines?

A. I don't recall whether I measured them or not. I don't think I did. If I did, I don't recall the measurements.

Q. Were they four inches?

A. My recollection is that they were possibly four inches, yes; they may have been four and a half; may have been three and three quarters.

Q. And of course the tanks fit up fairly close to the bulkheads, do they not?

A. That is correct.

Q. That is shown for instance in Libelants' Exhibit 4, is it not?

A. That indicates that that tank is tipped up; it would throw it a little closer to the edge of the bulkhead than it might be normally.

Q. But it would be very close to the bulkhead?

A. Yes; fairly close; within an inch.

Q. And the lower opening is partly filled with the valve fixture that comes through it, is it not?

A. Yes.

Q. And the upper openings, where the filler lines went through, were the same diameter, approximately?

A. Approximately, yes.

Q. And they were two-inch filler lines which went through there, were they not?

A. Two-inch pipe, yes; inside diameter.

Q. That would be how much exterior diameter?

A. Approximately two and a half; two and five-eighths inches outside diameter of the pipes.

Q. And the tanks would fit as closely behind the bulkheads, in the vicinity of the filling holes, as they would the outlet valves; is that correct?

A. It would if the bulkhead was perpendicular, parallel with the tank, the side of the tank.

Q. It should be perpendicular, should it not?

A. Normally, yes, it would be perpendicular; it wouldn't absolutely have to be.

Q. Now did I understand you to say that in your opinion those eight holes in the bulkhead would make sufficient ventilation for the tank compartment?

A. There was other ventilation besides that.

Q. That other ventilation?

A. There was ventilation between the pan and the side of the bulkhead, all around.

Q. How much was that?

A. Over an inch; an inch to an inch and a quarter.

Q. Around the edges of the pans?

A. At the bottom of the bulkheads where the pans fitted in.

Q. And the space below that—

A. That is at the end where the tank—or the pan, is rectangular.

Q. And the space below that is ventilated by this hole in the bulkhead, seventeen and a half inches by twenty eight inches, is that right?

A. I assume that is one of the holes; there may have been others; and there may have been other places for air to have circulated through there. There was a space under the floor forward of that.

Q. And so far as you know, that floor covered that space entirely, did it not?

A. Which floor?

Q. The floor forward of the tank compartment.

A. The main floor of the vessel?

Q. The main floor of the vessel.

A. I assume it did.

Q. Then the only ventilation would be through this hole seventeen and a half by twenty eight inches in the center of the compartment at the level of the engine room floor, is that right?

A. That was one of them. There was another place that might have been opened, where the steering gear went up to the pilot house; that may have been open through there; that floor may have been away from there. There may have been other ventilation places there.

Q. You don't know of any such thing?

A. There is no indication of it now. There had to be a shaft there,—a shaft-way for the—

Q. A shaft large enough to take the steering chains?

A. The steering chains or, judging from the type of steering gear that she had on her I assume that would have been a shaft because the rack is down below the main floor—the steering gear.

Q. What would be the diameter of this shaft?

A. Inch and a half; two inches; inch and a half.

Q. That would operate in a bearing, would it not?

A. Yes, but there had to be also a requirement there for the engine room telegraph to lead down through, and open enough for a man to work on it; install it.

Q. The engine room telegraph consists of pull-wires, does it not?

A. It does; but you have to get in there to install them, and you have to have room enough to install and repair them.

Q. But you know of no—

A. No, there is no indication today of what was there. There might have been a space there six feet square; I don't know. There may have been a space two feet square; may have a grille on one side, and might not have; may have solid wall.

Q. Let's just assume the things we don't know about, didn't exist. If they didn't exist, you would still say that these openings that we have been talking about would furnish adequate ventilation for the tank compartment?

A. I don't say that those holes in the bulkhead furnished adequate—no. I don't think that they were the entire form of ventilation for that compartment.

Q. If they were, you would not consider that adequate ventilation?

A. If they were, I wouldn't say that that was quite sufficient, no.

Q. Now in the engine room, there has been some testimony to indicate there may have been what have been described as gooseneck ventilator pipes, consisting of two-inch pipes with a gooseneck above the deck, turning over toward the deck, the pipes running down and into the bilges in the engine room. In the first place, did you see any—have you at any time seen any evidences of the presence of such pipes?

A. No, I have not. That doesn't say, though, that they weren't there. I wouldn't say that they weren't there. It is customary to put those in.

Q. Well the point is, that you saw no evidences of their having been there; is that right?

A. I can find no pipes or see no goosenecks, no. There is a lot of things missing off the boat that could have been there.

Q. Just answer my question, please. Would you consider such gooseneck pipes, if they had existed, would have been any assistance in ventilating the engine room?

A. They certainly would; they would have been of great assistance.

Q. Do you consider a two-inch pipe to be adequate for a ventilator pipe in an engine room the size of the engine room of the Seminole?

A. If there was more than two—if there were four, I would say, yes.

Q. Well when you testified that you considered that the engine room of the Seminole was adequately ventilated, were you taking into account the possible existence of such pipes?

A. I was.

Q. How would such pipes assist in the ventilation of the engine room?

A. The air as it was forced into the engine room by the other cowl ventilators, the large cowl ventilators, that only came through the deck and by the windows, the air would have been forced down through the floor and out through these gooseneck ventilators, with the pressure built up inside of the engine room.

Q. Do you know what the standard size—recognized standard size for such ventilator pipes in a vessel the size of the Seminole, would be?

A. No, I do not.

Q. Isn't it a fact that the recommended size of such ventilator pipes, by the Board of Fire Underwriters, is six inches or more?

A. I don't know. I have never read that.

Q. And at least three inches is recommended for vessels twenty feet and under?

A. I couldn't say.

Q. Now without such ventilator pipes, do you think there would have been adequate bilge ventilation in the Seminole?

A. I don't know what ventilation there was aft. There may have been a manhole on the after deck, which led from the bilge. If that was there it would assist a great deal in the ventilation of it.

Mr. Underwood:

Let him finish.

A. There are a lot of things—there are a lot of ways—

Mr. Matteson:

Before he goes further, that is not answering my question nor giving direct testimony as to conditions; just merely speculating as to what may have existed; and I object to him proceeding along that line, and move to strike out the answer.

The Court:

Read the question. (Last question and answer read by reporter.) I think the question itself rather asks for speculation.

Mr. Matteson:

I will withdraw the objection to it, if your Honor please, and follow it up.

Q. Well then, when you testified that there was adequate ventilation in the engine room of the Seminole, are you assuming that such things as you have suggested, —such as a manhole aft, existed?

A. I assume that there was the normal amount of ventilation holes used in the boat, practically. I have never seen one without such things.

Q. Then as I recall the question that was put to you yesterday, it assumed merely the presence of the skylight, and the presence of the window in the passageway, the presence of the hatch, the presence of the window on the port side of the engine room; and you testified on the basis of the existence of those things that there was adequate ventilation in the engine room. Now I understand now that you are also assuming that there were other means of ventilation, which were not included at that time—included in the statement, which I am giving you now: is that right?

A. I will still hold on the first point too, although it is contradictory to what I just said; that it is possible to ventilate that engine room alone with what openings there were in that engine room; the windows, the hatches, and the cowl; the engine room alone—not the bilges.

Q. Yesterday you made some comment with respect to Libelants' Exhibit 24, regulations for the prevention of explosion and fire on motor boats, approved by the National Board of Fire Underwriters; and I think that you suggested that these regulations were one man's opinion.

A. That is correct.

Q. I call your attention to the statement in the rules, the seventh paragraph:

Mr. Underwood:

Before you go further, may I ask that the previous question be read? (Question beginning at 5th line on this page, and answer, read by reporter.)

Q. —Which reads as follows: After examination of many boats, and doing everything possible to avoid unnecessary expense, the matter was taken up with the Na-

tional Board of Fire Underwriters, and the following have been considered necessary by their engineers.—That would seem to indicate that it was more than one man's opinion, would it not?

Mr. Underwood:
I object to that, if your Honor please; the document speaks for itself; the testimony of the man who said that he was the author of it, speaks for itself.

Mr. Matteson:
I don't think he said that he was the author of it.

Mr. Underwood:
That is my recollection. At all events, the document speaks for itself.

The Court:
I think that is arguing with the witness. I sustain the objection to the question.

Q. Well, I would like to ask you about one or two of these things and see how much disagreement there is between your point of view, and the point of view expressed here. For instance, in the 10th paragraph, on the page that I have referred to, it is stated that all tanks should have an indicating device, and such device shall not consist of glass gauges other than those of bullseye type, or of petcocks.—do you disagree with that?

A. I do.

Q. And the next paragraph, that—All outlets for drawing gasoline for any purpose whatsoever, be prohibited in the engine room.—Do you disagree with that?

A. I disagree with that too.

Q. And the next page,—that drip collectors be fastened on all carburetors; openings should be screened with #40 mesh brass.—Do you agree or disagree with that?

A. I disagree with that.

Q. Well what is your point of disagreement on that?

A. Because there are carburetors today that the drip pan is entirely unnecessary; that such conditions are taken care of by the manufacturers of the carburetor.

Q. Then I understand that you don't approve of drip collectors on the carburetors?

A. They have no particular value, in my opinion. In my experience, is that such a thing only leads a person to disregard flooding of a carburetor; say, Well the drip pan will take care of it: when it does not, only to a certain point. It is just as dangerous as not having them at all.

Q. If the carburetor does flood, it does prevent gasoline from going into the bilges, doesn't it?

A. Temporarily, yes.

Q. And you think because—(interruption). The next paragraph is that, There shall be a cut-off valve at each tank and each carburetor.—Do you disagree with that?

A. I don't see it is necessary under all conditions. It depends a great deal on the installation of the tanks and the motors and everything else.

Q. Now the next paragraph, that—Three-inch or larger ventilating pipes running all the way down to the bilges, be placed in all four corners of the engine room.—Do you agree with that?

A. I agree with the fact that ventilators, gooseneck ventilators, or any ventilator running to the bilge, is good practice; not absolutely necessary in all types of vessels though.

Q. Now do you agree with this statement: No ventilation above, either at deck or sides, will remove these vapors.—Referring to gasoline vapors.

Mr. Underwood:

Where is that found?

Mr. Matteson:

That is on page 3 of the exhibit; paragraph at the bottom, above the signature of A. C. Hudson.

A. Read that question again, will you, please.

(Last question read by reporter.)

Mr. Underwood:

I object to that, on the ground that the whereabouts of the gasoline vapors referred to, is not apparent—not included in the question. Where are they? What boat are they in? What type boat?

Mr. Matteson:

I will read the paragraph back; perhaps we will have it in more complete sense. Beginning with the statement that I read before, that three-inch or larger ventilating pipes running down all the way to the bilges, be placed in all four corners of the engine room. These shall be made so that they cannot be closed. The little water that will enter in a heavy sea would be negligible in comparison with the danger of confined gasoline vapors. Two of these pipes should be provided with electric fans, to remove gases from the bilges. If a suction fan is used, motor must be of the explosion-proof type, and located outside of fan duct. These fans should be run for at least ten minutes before starting, and after shutting down engine. Where boats are so small as to make electric fans impracticable, the same pipe should be installed with the fans omitted. No ventilation above, either at deck or sides, will remove these vapors.—

Q. I call your attention particularly to the last statement, which I take it refers to vapors in the bilges, in the lower part of the engine room. Do you agree or disagree with that?

Mr. Underwood:

I object to the question, on the ground that the type of vessel, and relative location of other ventilation in the bilges, and other pertinent information, is not included; therefore it is not a proper hypothetical question.

The Court:

I think the witness may explain; he is asked if he disagrees with that described rule of construction. If he thinks—if he wants to make any remarks about it, he may; or any difference in boats, to be brought out, may be brought out on redirect examination. I overrule the objection.

Q. What is your answer?

A. I do not entirely agree with that. It depends entirely on the construction of the vessel, the type of vessel, and a great many other conditions. You could put a cowl ventilator on deck, that would force air into that compartment and out through the bilge at a different point, and accomplish the same thing, without a blower, or without the vents leading entirely to the bilge. It depends entirely on the capacity of your engine room, the size of it, the volume of it.

Q. Well, we will refer to an engine room of the size of the Seminole. I take it that you would only disagree with this statement if there were other means provided in the bilges or lower part of the engine room, through which the accumulations of gasoline vapor could be exhausted: is that right?

A. I don't get that question.

Mr. Matteson:

Will you read that?

(Preceding question read by reporter.)

A. I am afraid I still don't get the twist of that question.

Q. Well, I will try to rephrase that. This statement, —No ventilation above, either at deck or sides, will remove these vapors,—you would agree with, if there were no means provided in the bilges or the lower part of the engine room for exhausting—to permit the exhausting of gasoline vapors?

A. I would say that you could not completely rid that engine room floor with such ventilation, unless there was other forms in the boat; some bilge ventilation at the sides, such as the goosenecks, as have been previously talked about.

Q. Now I think you said you did have some familiarity with the rules of the National Fire Protection Association, copies of which have been marked Libelants' Exhibits 25 and 97?

A. I say, I have seen copies of them. I do not possess a copy of them.

Q. And you say that taken as a whole, it is your understanding that they are not fully followed?

A. They are not fully followed; no.

Q. Well, now let's see where you disagree with these rules. Take for instance page 3 of Exhibit 25, paragraph 1(d): Seams of ferrous metal tanks shall be welded, or riveted and welded.—Do you disagree with that?

A. I disagree with it, on the grounds that there are other forms of sealing that tank besides caulking or welding.

Q. Apparently the sense of this rule is that other forms are excluded.

A. That is the sense of the rule as I gather it.

Q. And you disagree with the rule, for that reason?

A. I don't believe that you have to live up to the letter of that rule there just because they say it shall be welded, necessarily, when brazing would do just as well, or soldering.

Q. Brazing of course is used only on copper or brass, is it not?

A. No; used on iron, as well.

Q. The next statement is,—All outside rivet points and heads shall be welded.

Mr. Underwood:

If your Honor please, I object to that on the ground that it is not fair to call specific items to the attention of this witness, without giving him the benefit of the following, which is the very initial paragraph in the regulations as they appear in Exhibit 97, which is: No provision in these regulations is to be retroactive as regards construction.—Matters of construction. The Witness has said that he does not possess a copy of them, hasn't used them in practice. I don't think it is fair to catechize him about specific sentences without letting him have that information as well.

Mr. Betts:

Now you have given it to him; go ahead.

Mr. Matteson:

We have referred to these rules as standards of practice, if your Honor please. This witness says he does not fully agree with them. I want to make clear the points on which he does or does not agree.

The Court:

Well this witness has expressed an opinion as to the construction of the Seminole. Now provided you incorporate in your question the proper assumptions in regard to what these rules are, then you may question whether he agrees or disagrees. Any observation that Mr. Underwood makes there about any general suggestion, is proper to be incorporated; or any other sugges-

tion you want to call to the witness' attention, Mr. Underwood, you may do so—as to what these rules are. In other words, here is a system of rules that this witness says he does not follow and does not recognize. I think you are entitled, Mr. Matteson, to inquire if he agrees or disagrees with certain rules.

Mr. Underwood:

If your Honor please, these rules don't even purport to cover the Seminole; because it expressly says they are not to be retroactive. The Seminole was built and her gasoline tanks were installed, before 1930, the date the rules were promulgated; so it is utterly immaterial.

The Court:

What do you say to that? Why should the witness be interrogated about these if they don't apply to the Seminole?

Mr. Matteson:

If we were going to apply them as rules, there might be some force in that statement. But what we are applying them as, are standards of due care. And they are standards of due care, no matter when a vessel was built.

The Court:

Well I think you may ask that, but I think you ought to ask it independent and unconnected with the matter of these rules: Do you think so-and-so? Do you think the Seminole should have been constructed along certain lines? But to have this witness explain why he disagrees with those rules, when the rules on their face don't apply to the Seminole, I think is improper.

Q. Now, do you agree or disagree with a statement that—Outlets on gas feed lines for drawing loose gasoline

for any purpose whatever, are prohibited in the engine compartment?

Mr. Underwood:
If your Honor please, I object to that. Here is a statement now draw actually out of this book, I suppose, but apparently out of thin air. I don't think it is proper to catechize the witness.

The Court:
I sustain that objection. The question is, Mr. Matteson, "are prohibited". Now we must have some standard. If that standard is inapplicable to the Seminole, I think it is not a proper basis. I think you can ask him, Do you think so-and-so?—the conclusion that that states; but not ask him whether he agrees with a certain statement that a certain method of construction is prohibited.

Q. Put it this way: Are you of the opinion that gasoline feed lines for drawing loose gasoline for any purpose whatever, are prohibited in the engine compartment?

Mr. Underwood:
I object to that; it is the same question.

The Court:
I think that is the same question. I hope I make myself clear, Mr. Matteson.

Mr. Matteson:
Will he read the question?

(Last preceding question read by reporter.)

Mr. Matteson:
That is, "*should be* prohibited".

A. There are conditions where those draw-off lines should not be prohibited.

Q. That is your opinion?

A. It is my opinion. I wouldn't hesitate to install one on a boat if I thought it necessary.

Q. Well would you—do I understand you, that you consider that they would be properly installed in a vessel of the type of the Seminole?

A. You say, that they could be properly installed?

Q. Yes.

A. They could.

Q. And of course an item such as an outlet on a gas feed line is not an item of permanent construction, is it? In other words, it is a matter that can be readily altered?

A. It can be readily altered, yes. They can be removed at any time.

Q. That is a simple matter?

A. Yes, sir.

Q. Can you give us a rough idea of the dimensions of the engine room of the Seminole?

A. Very rough; I didn't measure it. I would say that it was approximately twelve to fourteen feet long; probably nearer fourteen feet long; and possibly twelve feet wide, I think; eleven or twelve feet wide; maybe more than that. I did not measure the compartment.

Mr. Underwood:

Sixteen feet four and a half; twenty feet wide.

A. Twenty feet wide? Wider than it was long?

Q. I think that is about right. And have you got the height?

Mr. Underwood:

I don't want to mislead you about that; width at a point four feet above the bilge is twenty feet; that prob-

ably includes the alleyway. Width of the engine room above the cabin floor level, between the port side of the hull and the fore and aft window on the starboard side, seventeen feet. It would make it approximately square; sixteen by seventeen.

Mr. Matteson:
Sixteen feet long?

Mr. Underwood:
Fore and aft.

Mr. Matteson:
And have you the depth of it?—from floor to the skylight?

Mr. Underwood:
I have the height in the way of the raised trunk, eleven and a half feet. Height from engine room floor to deck line; ten feet.

Mr. Matteson:
I think that will suffice.

Q. You were referring to the valve, here the other day, that has a composition seat in it, and said that there are composition seats that are satisfactory for gasoline. You don't know whether this valve had such a seat, or not?

A. That is correct.

Q. Now I refer you to this exhibit—the ticket is off; this is Exhibit number 17, which includes a trap, used in the gasoline line. Is that what you call it?

A. That is what it is, a trap; gasoline trap, or fuel trap; not necessarily gasoline.

Q. The purpose of a trap of this type is to permit water or impurities to filter out of the gas and accumu-

late in the lower part of the trap, where they can be drained off: is that correct?

A. That is correct.

Q. Would you approve an installation in an engine room, which incorporated a trap of this type in the gasoline line, and then led a feed line from the bottom of a trap to one of the auxiliary gasoline motors?

A. I wouldn't say that it was good engineering practice; no.

Q. As a matter of fact it is very poor engineering practice, isn't it?

A. It is not the best.

Q. I want to get back to that test which you made of these tanks, for just a minute. When you ordinarily make a hydrostatic test, by placing a riser on top of a tank, and putting a head in it, what is the method of determining whether or not the test is successful?

A. To note the drop in your riser.

Q. That is, you have a riser of small diameter?

A. That is correct.

Q. Which is adequate to secure the head and pressure in the tank, but a small leak or distortion below will permit the water to fall noticeably in the riser; is that right?

A. It would.

Q. And that is the usual method of making the hydrostatic test, —to leave that condition for a period, and note whether the water falls or not, in the riser?

A. That is right.

Q. Now did the water fall in the riser that you used in connection with this test?

A. It did.

Q. And that was because of the leaks that you have described to us, that you were unable to stop?

A. It was.

Q. Consequently you couldn't determine by that method, by the usual method, whether the test was successful or not, could you?

A. That particular test there was not completely satisfactory.

Q. Now you spoke of the oxidation of the tank by exposure, since last May. Will you tell us just what that consisted of? I think you said something about red lead paint having disappeared from it.

A. That is correct. That was on the lower portion of the tank, that was buried in the ashes before I removed it from the compartment.

Q. It was painted with read lead, you say?

A. There was red lead paint on it when I removed it from the compartment.

Q. And there were no traces of red lead paint when we saw it the other day?

A. It had been washed off by the rains.

Q. Now you have talked to us some about the priming of the engines. Why is it ever necessary to prime a gasoline engine?

A. Because when a motor is cold it doesn't get the proper amount of gasoline in the combustion chamber, or into the cylinder itself, by merely drawing it through the carburetor, unless you choke it or prime it.

Q. And as a matter of fact, the purpose of priming is to make it start quicker; isn't that right?

A. A motor that has to be primed will not start at all without priming it.

Q. I see; what you need in the cylinders in order to make the engine run, is to force gasoline vapor up?

A. You do.

Q. And when your engine is cold, gasoline is drawn in the metal manifold and does not vaporize so readily?

A. No, it does not.

Q. And is that the reason you have to prime engines when they are cold?

A. That is the reason.

Q. Now when they are hot, the engines have turned over, gasoline is drawn into the manifold, the heat will vaporize the gasoline, will it not?

A. It will if the manifold is short enough.

Q. And that would give you your necessary supply of gasoline vapor in the cylinders?

Mr. Underwood:

If your Honor please, I object to this unless the size and type of the motors is included in the hypothetical question. According to the witness' last answer he needs that information properly to answer his question.

Q. I am talking about the engines of the size and type of the Seminole, particularly.

A. Well in the engines of the Seminole the manifold is quite long; the intake manifold is quite long; and that type of motor will not start, even when hot, without slight priming. It doesn't take the amount of priming when they are hot, as it does when they are cold.

Q. Have you ever operated the engines of the Seminole?

A. I have never seen them before, until this case came up.

Q. Now there is testimony in the case that the reason why it was necessary to supply—to prime the engines of the Seminole, was that the air supply, compressed air, used for starting the engines, was not adequate to turn the engines over for more than a very few revolutions. That would be a reason for priming the engines, would it not, if it were a fact?

A. Certainly would.

Q. And you of your own knowledge know of no different reason, do you?

A. I know of no reason why.

Mr. Underwood:
I am sorry; was that answer completed?

(Last question and answer read by reporter.)

Mr. Underwood:
Does that complete your answer?

A. I said all I wanted to.
Q. You said some wicking that would be used for packing a glass gauge is good—a glass gasoline gauge, is good, and some is not.
A. That is correct.
Q. What kind of wicking would not be satisfactory for that purpose?
A. Anything made of rubber. Cotton is perfectly satisfactory; it is not as good as asbestos, however.
Q. Of course you don't know what the wicking actually used on the Seminole was, do you?
A. No, I do not.
Q. You were saying yesterday that after a test had been made of the gasoline tanks, the gasoline from the gauge glass could be run back into the manifold line?
A. It could be; yes.
Q. Just how would you accomplish that?
A. It could be drained out before the tanks were turned on again; you could turn the tanks off.
Q. You would have to first turn off all the tanks?
A. You would.
Q. And then you would drain the valve through the gasoline discharge pipe?
A. You would open the—leave the lower valve of the gauge open, and let what gasoline there was in there run into the line; or if they were full, it would run into any carburetor chamber, or wherever there was room, you could start up your motor that way.

Q. Then as I understand it, every time you wanted to get the gasoline out of the glass gauge, you would have to do it in one of two ways; either by starting up some of your gasoline-consuming machinery, or else by opening the draw-off valve and drawing it out?

A. That would be correct.

Q. I think you said yesterday that if the valve on the feed lines adjacent to the manifold lines were shut off, there would be no head of gas anywhere in the gas line, between that point and the carburetors; is that right?

A. There would not be as much head.

Q. There would be some head?

A. There would be a very slight head, yes.

Q. And of course, where the line was such shape that it ran down and under the floor and then up to the carburetor, air could return into the lines through the carburetor, could it not?

A. No, it would not.

Q. You think not?

A. It would not; no.

Q. Why not?

A. There is a float valve in the carburetor that shuts that off. Even if it wasn't there, air would not enter that pipe, either.

Q. You spoke of your objection to soldering pipes, and that if they were removed—if you wished to remove the pipes or break the connections, you say you would have to use a blowtorch to get the solder off.

A. An open flame; a blowtorch, or a torch of some kind. They would have to be heated.

Q. Soft solder can be removed with a knife, can it not?

A. It can be, but it would ruin the fitting; if you attempted to turn that pipe out of the fitting, that solder would ball up in there and make an awful mess. If you wanted to throw the fitting away afterwards, yes.

Q. I think you said yesterday that there do come times when through necessity you have to tear down the gasoline lines. What did you have in mind by that?

A. Possible stoppage from foreign matter. Some—.

Q. Anything else?

A. No, that would be the only reason, unless you wanted to change the location of the line.

Q. Of course if you tighten such connections repeatedly, there comes a time when there is only one thing to do, and that is, renew them; that is correct?

A. That is correct.

Q. That would be such an occasion, would it not?

A. That would be one occasion. You might discover one faulty fitting in the line, up at the end, where it had to be undone from the end; unmade, right up to that fitting—unless there were unions in the line.

Q. I think you spoke yesterday of the fact that according to your observation there was a little burning of the timbers in the floor of the engine room and in the bottom of the tank compartment, as evidence of the fact that there was no gasoline in the vicinity of those members at the time of the fire. Did I understand you correctly?

A. I don't believe that I said that there was no presence of gasoline. I said there was no severe fire there.

Q. Well, if the lower parts of the engine were filled with gasoline vapor, but not gasoline liquid, a fire might be started by an explosion, or a condition of the gasoline vapor, without any necessary charring of those members; isn't that correct?

A. I don't know that I can answer that exactly.

Q. In other words, dry gas, or gasoline vapor, would burn or explode quickly?

A. If there was gasoline there, or gasoline fumes, I would assume that the thing would blow up in one flash.

Q. And then it would be over?

A. Then it would be over; wouldn't set fire to anything, unless there was some more liquid to burn afterwards.

Q. If there were liquid gasoline remaining then that would burn and char the members in its vicinity?

A. It would.

Q. I think you said yesterday that you would not hesitate to go into the engine room of the Seminole if she had been laid up for two months, and throw an electric knife swtich on a switchboard, if you had not smelled gasoline; is that correct?

A. That is correct.

Q. If you had been warned—I will say if you had smelled a strong bilgy odor, and had been warned against the danger of striking a match or making a light, would you have felt the same way about it?

A. I think that if I had been warned, I might have taken a little more precaution, examined a little bit closely. A bilgy odor is not necessarily gasoline.

Q. It would show—a bilgy odor would show lack of ventilation, of course, would it not?

A. Not necessarily.

Q. What would a bilgy odor indicate to you?

A. The odor of stagnant water in the bilge, if there was any.

Q. Well the odor in itself would indicate lack of ventilation, would it not?

A. I don't think so. I think you could have that odor without—or with even ventilation.

Q. You say that one reason why you would have no fear of throwing a switch in the engine room, would be that you would expect no spark, or a very small one, when you closed the switch?

A. I would expect no spark at all with the switch when I closed it, if the switchboard was high enough above the floor—

Q. What was that?

A. If the switchboard was sufficiently high above the floor so that there would be little danger of any fumes reaching to the switchboard.

Q. You would not expect any sparks on a switchboard or in its vicinity, if you closed a knife switch in the engine room, would you?

A. I certainly would not; not on one hundred ten volts.

Q. And if you closed a switch on the lower left hand corner of the switchboard and there was an emanation of sparks; eight to ten inches to the left of that, that would have been something unusual, wouldn't it?

A. I wouldn't expect it; no.

Q. That would have been what you would call a short circuit, would it not?

A. Well that I couldn't say, what it was—would be.

Q. It certainly was something that should not occur under those conditions?

A. Something—no, it should not occur; you wouldn't expect it.

Q. Well when you get an emanation of sparks, in a supposedly closed and insulated circuit, that is what you call a short circuit, is it not?

A. Yes.

Q. And such thing will not occur if the lines are properly insulated and in proper condition, will it?

A. No, you wouldn't get it from properly insulated wire.

Mr. Matteson:

That is all.

By Mr. Botts:

Q. Mr. Munroe, you have testified with reference to the expansion of gas—I mean, of air, in the gasoline tanks, and the necessity for a large or small vent pipe. I would

like to know whether or not you have ever made any technical study as to the expansion—the coefficient of expansion of air in relation to change in temperature.

A. I have made no technical examination and study.

Q. You don't know what that is, do you?

A. No; I know that it does exist, though.

Q. Do you know enough to know whether or not that expansion is relatively small in relation to the entire volume of air?

A. That—I do know that that depends a great deal upon the variation of temperature, and also atmospheric conditions. You can get the same breathing with difference in atmospheric conditions.

Q. You say that the coefficient of expansion of the air will vary with the atmospheric conditions as to humidity?

A. Not if you want to call it the coefficient of expansion of air, I don't mean that. I mean that a tank will breathe due to the difference in atmospheric pressure on the inside of that tank and the outside, due to atmospheric pressure—I mean barometrically speaking; not in temperature but in barometric pressure; that depending entirely on the size of the vent pipe.

Q. But do you have any idea at all as to what that coefficient of expansion of air is, in relation to change in temperature?

A. No.

Q. You don't have the least idea about that?

A. I don't know; no. Not necessary for me to know that; I can find it in one of these books here.

Q. Can you—would you mind finding it?

A. I don't know; it might take a little time for me to find it.

Q. I would like to have that, if you have got that in your book.

A. I don't know if it is in this book or not.

Q. Well I won't finish on it, so if you have any book with that in it, I would be delighted to have you produce that tomorrow.

A. It varies with the temperature.

Q. All right, can you from your books of reference or any other source, give me that coefficient of expansion in relation to change in temperature?

A. I believe I can give you what you want; I am not sure:

Q. All right; if you would, just in order that we may be satisfied with reference to your source of information, bring your reference book with that in it.

A. All right.

Q. All right sir; then I will pass that question until tomorrow. Now Mr. Munroe, I am not at all sure in my mind the shape of those drip pans that you mentioned in there. I understand that they were square at one end. Would you mind taking a pencil, if you have one—I don't suppose you like mine, because they write like a nail, very hard:

A. I left my pencil home.

Q. Now suppose you draw a section of the tank compartment showing both drip pans and their shape; that would be—they are divided:

A. That's the plan.

Q. I don't want to file this in evidence; I just want to be sure that I understand. Then as I understand it, these drip pans followed generally the curve of the gasoline tanks, in the center of the vessel, and were square at the outside of the vessel?

A. That is correct.

Q. Generally speaking; all right. Now then these wooden four by four supports upon which the tanks rested, were you able from the examination that you have made, to determine in what method those four by fours were installed underneath the half-circular end of the drip pan toward the center of the vessel?

A. No, I could not tell, because I didn't remove those two tanks, and there is no way of reaching in there—at least I didn't attempt to reach in there to find cut.

Q. Then you don't know at this time how those supports were underneath the two center tanks?

A. No.

Q. You didn't take them out.

Mr. Underwood:

Indicating the curved surface of the tanks—curved ends of the tank.

A. Semi-circular.

Q. Then the only one you know how they were installed, was undernearth the single tank?

A. Number Four tank.

Q. And that was removed—

A. And number One tank—the square end. You can see number one after you remove number four.

Q. There was no possibility, the way these tanks were installed there, while they were all in place, for a person to examine them and ascertain whether they leaked, was there? I mean, by physically examining the tank.

A. The only part of the middle two, maybe; I don't know what other hatches there were. There was room between number one tank and the outer side of the vessel to have seen down, and for a man to have gotten that side of number one tank.

Q. Now let me—I call your attention now to the Libelants' Exhibit No. 11, the double cut-off valves, from the draw-off line. Do I understand you to say that from your examination, both of those valves were in good shape, and proper, prior to the time when the composition was destroyed by the fire?

A. I can see no reason, at the present, under the present conditions, that they weren't correct.

Q. Do you see any—if they were both in good shape, any reason for two valves for that draw-off line?

A. Yes, I see a reason for two valves.

Q. What?

A. Because two valves are better than one.

Q. I see.

A. That is a very simple answer.

Q. If one was good, the other would be unnecessary, is that true?

A. No; the second one is a double precaution; it is a safety factor. I mean if you had a piece of wire that would hold, and your tension was five pounds, and you put one in there that would hold ten pounds, you didn't need the other five pounds, but you had it there for a factor of safety.

Q. Now let's get to the question. If the first—if one valve was good, and in good shape, then the other didn't serve any purpose in cutting off the gasoline, did it?

Mr. Underwood:

If your Honor please, I object to that an argumentative. I think the field has been covered, and the testimony is clean on it.

The Court:

Well I don't want to cut off Mr. Botts; I think the examination is proper; I am sure he thinks he is developing something that hasn't been developed; so I overrule the objection.

A. What was the question again, please? (The last question preceding, was read by the reporter.)—If the inner valve was tight, the outer valve didn't hold back any gas; no, except what was in this short line here, depending on whether they closed off the outer valve first, or the inner valve first.

Q. Now I understand you to say that you think a draw-off line in an engine room, such as we have in the

Seminole, is proper and a desirable installation; am I right?

A. I believe that such a draw-off valve is perfectly safe, perfectly practicable, in a boat of her type.

Q. Now then my recollection of the reason you gave for that opinion was, that it was convenient to have it readily available for the purpose of drawing off gasoline for priming; is that one of the reasons?

A. That was one of the reasons; yes.

Q. Now I don't recall the other reason; would you mind just telling me what other reason you thought that was desirable?

A. You mean, outside of the use for priming?

Q. Yes; that is one reason—to get gasoline for priming. Now for what other reason is it desirable?

A. Because she was used as a cruising houseboat, with several small tenders, that had to be supplied with gasoline. It was impossible for them to get gasoline from any shore station where she cruised, and those boats had to be supplied; and any gasoline that was being furnished to those boats, it was better to have it come under the supervision of a licensed, or at least experienced man, who operated that gasoline.

Q. Then as I understand your point, it is substantially this; that if they were going to secure their supply of gasoline for other boats, from the Seminole, it was better to have it in the Seminole—in the engine rom, than elsewhere; is that it?

A. That is correct.

Q. But do you agree that it would be better and safer not to draw it off at all for that purpose?

A. No, I won't agree with that.

Q. You don't agree with that?

A. No.

Q. You think then that it is just as safe to draw off gasoline in an engine room, and transfer it through buckets or containers, and put it in other boats—it is your

opinion that that procedure would not in any way tend to create a fire hazard, by leaving gasoline vapors in the vessel?

A. If properly handled, there was no more danger than there is filling your automobile at a filling station on the street.

Q. Now wait a minute; do you mean to tell me—did you hear the testimony as to how it was said this gasoline was drawn off in that vessel—in the engine room?

A. I heard some of it, yes.

Q. You heard the testimony, that they set an open container such as we have, Exhibit 13, underneath this draw-off valve, and allowed gasoline to flow into that container?

A. Yes.

Q. And then when it was full they would hand it out the window; you heard that testimony?

A. I did.

Q. All right; now then do you think that that procedure would cause, or be likely to cause any gasoline fumes to be left in the engine room?

A. A very, very small percentage.

(At 5:05 o'clock p. m., hearing was recessed until 9:15 o'clock a. m. of the following day, to-wit: October 12, 1939.)

3444 Miami, Florida;
Monday, November 13, 1939.

Hearing was resumed pursuant to adjournment of Friday, October 13, 1939.

3445 CAPT. J. W. BRYANT as a witness on behalf of Respondent, was recalled and testified as follows:

Direct Examination.

The Court:
You have been sworn previously in this case?
A. Yes, sir.

The Court:
Your oath that you have already taken covers the balance of your testimony.

Mr. Matteson:
If your Honor please, I understand that Captain Bryant is now being called as a witness for Respondent Phipps, and that this is not further cross-examination, but examination on behalf of the Respondent Phipps?

Mr. Underwood:
That is correct.

The Court:
Did you make the point as to his oath?

Mr. Matteson:
Oh, no, sir.

The Court:
I admonish you though, Captain, that the oath that you have taken in the case is binding on your testimony now

By Mr. Underwood:

Q. Captain Bryant, did you ever go to Pilkington's yard in Fort Lauderdale with J. F. Riley?

A. Yes, sir.

Q. Do you remember any particular time when you went there with him?

A. Why it was in the first of the year '31. They notified me, Mr. Riley did, that he had taken charge of—taken over the Seminole from the Miami office, and she was down at Pilkington's yard at Fort Lauderdale, as I recall it; and he asked me to drive down with him, because he had never been down there; and I drove down with him.

Q. You went down in whose car?

A. Mr. Riley's car.

Q. What happened on the way down?

A. Well we got lost on the way down; getting to the yard, we got on the wrong road, and rode around down there.

Q. Between Lauderdale and Pilkington's yard?

A. Yes, sir.

Q. What happened when you got to Pilkington's yard; did you see Mr. Pilkington?

A. Yes.

Q. What happened then; what words passed between you three?

A. Well Mr. Riley had never met Mr. Pilkington, and he was taking over the boats,—Mr. Riley was. And Mr. Pilkington came out, and I introduced him to Mr. Riley, and told him that Mr. Riley was taking charge of the boats, and all of the correspondence and stuff would be addressed to Mr. Riley and the Palm Beach Company.

Mr. Underwood:

You may cross-examine.

(Informal recess was had).

Mr. Matteson:
No cross-examination of this witness, if you Honor please.

(Witness Excused.)

3447 Thereupon, Mr. WIRTH MUNROE as a witness on behalf of Respondent, was recalled and further testified as follows upon

Cross Examination.

Mr. Botts:
Mr. Matteson has some questions to ask.

Mr. Underwood:
If your Honor please, Mr. Matteson had concluded his cross-examination, and Mr. Botts was cross-examining the witness when he was last on the stand. It seems to me we should have Mr. Botts conclude.

The Court:
Mr. Matteson may ask any question he has to ask.

Mr. Matteson:
It doesn't make any difference to me.

The Court:
Either way.

By Mr. Matteson:
Q. Just one or two things, Mr. Munroe. Last October when we visited the Seminole, your attention was called to the fact, was it not, that the side plates of the vessel had not been removed, but that new plates had been placed on the side over the old plates: That is a fact is it not?

A. That's the way it appears out there.

Q. At one stage of my cross-examination, some question arose as to whether this valve shown in this exhibit number 4 and 5, was the valve of No. 1 tank or the valve of No. 2 tank. Now I would like to straighten that out if I can; and I call your attention to exhibit number 3. You recognize exhibit number 3 as showing the valve of No. 1 tank, do you not? You can see the toilet connection and the small generator also, I believe?

A. It has the appearance of being No. 1 tank. I believe this is the valve; that's in the plating.

Q. Referring to the valve that is attached to the pipe marked sea connection; is that right?

A. That is correct. I didn't actually see the side of the vessel there.

Q. Well at the left hand lower corner of the picture—

A. That's the shelf.

Q. That is the deck stringer plate on the port side?

A. No, it is sort of a bilge stringer, web stringer, that runs all through the entire vessel, and it is the same height as the main deck forward and aft of the engine room.

Q. Well taking those things into—

(Discussion between counsel.)

Mr. Matteson:

I would like to have the witness satisfied.

A. I am satisfied now that that is No. 1 tank. I was doubtful about it before.

Q. Well you can identify the valve shown in number 4, with the valve shown in number 1, can you not? They are the same valve, same opening? I call your attention to the pipe attached to the valve,—upright pipe marked sea connection on number 3; and I believe you can see a part of it in the lower corner of number 4. Also you can

see the same piece of seaweed there coming through the opening, can you not?

A. That's the same opening.

Q. Same opening?

A. My previous assertion, my recollection was that that was in the—that piece of seaweed, so-called, was in the second opening; but my recollection was incorrect on that.

Q. You are satisfied now it was No. 1?

A. I am pretty sure it was No. 1; that it is No. 1.

Q. I think you said in the course of your examination that a cylinder or a sphere is the strongest form of construction; is that correct?

A. For what purpose?

Q. For any structural purpose; an arch is stonger than a straight surface?

A. Yes.

Q. And where the pressure is against the outside of the arc, so that you have a bridge effect, that is the strongest construction, is it not?

A. It is stronger than a straight surface; yes.

Q. I mean, stronger than it would be if the load was against the inside of the curve?

A. Not necessarily. Do you mean, whether the arch is inverted, or whether it is convex or concave?

Q. No.

A. Which side the pressure is on?

Q. Yes. That one which is convex toward the pressure, is stronger than one that is concave toward the pressure, is it not?

A. That depends entirely on the anchorage of your ends.

Q. Well I am assuming that the ends are anchored?

A. One has compression, and the other has tension, depending on which the curve is, and the weight to the curve.

Q. But the compression is the stronger resistance, is it not?

A. I don't know that you can say it is stronger.

Q. You don't concede that?

A. I wouldn't concede that it was the stronger, no; because it entirely depends on what your anchorage it on the other end.

Q. Well take a tank like the tank of the Seminole, with an inverted crown on the bottom; isn't it a fact that the—assuming the proper anchorage, of course—that the bottom would be the strongest part of the tank?

A. The bottom would be the strongest part of the tank for your down pressure, yes.

Q. Now getting back to that test in October,—or the test in May, rather, that you made: Were you present when the tank was lifted out of the Seminole?

A. I was.

Q. And when it was lifted out, do I understand that you had had some stringers placed so that the tank was placed in an upright position on the stringers?

A. That's correct.

Q. And when you made your first examination of that tank, was it then in the upright position on the stringers?

A. It was.

Q. Now after the test, as I understand it, a part of the bottom crown of the tank was pushed down out of line; that's correct, is it?

A. That's correct.

Q. You noticed that after the test had been made?

A. That was after the test was made.

Q. Are you able to say that that depression of a part of the crown was not there when the tank was first placed in its upright position?

A. That bulge in the bottom was done by myself; I put it there.

Q. Well now I didn't ask you that Mr. Munroe; and I move to strike it.

A. I beg your pardon. It was not there when the tank first came out of the compartment.

Q. How do you know that?

A. Because I examined the bottom before any water was put into the tank at all, or any testing was done.

Q. Well when you examined it, it was sitting these stringers, is that right?

A. That's correct.

Q. And those stringers were about four inches high?

A. There were two 4 x 4's.

Q. Two 4 x 4's?

A. Yes.

Q. Then how did you examine it, under those conditions?

A. I put my head down and looked up underneath it.

Q. Through this four inch space between the bottom of the tank—

A. Seven and a half inches, or seven inches. A 4 x 4 is three and five-eighths inches, to be exact, and there were two of them, one on top of the other.

Q. One on top of the other?

A. That is correct.

Q. Were there two sets of those?

A. There were.

Q. You feel pretty sure that that depression in the crown was not there when you started the test?

A. I am absolutely sure it was not there.

Q. You spoke of jumping on the top of the tank. Jumping on the top of the tank would not create any pressure on the contents of the tank, unless the top of the tank gave, would it?

A. The tank was completely filled with water; the top of the tank did not have to give but very, very little to create the same.

Q. The extent of the pressure you put on the tank by that means, would depend upon the extent to which the top moved, would it not?

A. No indeed.—Well it would to a certain extent, yes.

Q. Do you say that the top of the tank was depressed to any extent by your jumping on it?

A. It was; it had to be.

Q. Was it depressed to the same extent as the depression in the bottom on the tank?

A. No indeed.

Q. Well how much do you think the top of the tank was depressed by your jumping on it?

A. That is very hard to say; but, a very small amount.

Q. Well could you give us any idea of the measurement?

A. There might have been a variation of probably a sixteenth of an inch, or to an eighth of an inch,—which I doubt it was even that much.

Q. And did the top of the tank return to its original shape?

A. It did.

Q. Did you as a matter of fact observe that the top of the tank was depressed to any extent at all by your jumping on it?

A. I couldn't tell; I couldn't watch the top of the tank and be in motion at the same time.

Q. So you guess that it was a sixteenth or a little less, that was depressed—

A. I could have accomplished the same thing by using a timber or a maul or anything of weight hitting the top of the tank the same way; but not having that handy I merely kicked it with my heel.

Q. And of course, whatever you used, the pressure created would depend on the top of the tank's giving to a certain extent, would it?

A. It would have to give a very small part.

Q. And the pressure would depend on how much you would give it?

A. The pressure is multiplied terrifically in that distance between the top and the bottom.

Q. Well now you interest me. What authority have you for that statement?

A. It's the same principle as the hydraulic ram.

Q. Well what is the principle of the hydraulic ram?

A. A hydraulic ram is a container solid full of water, with a small piston at the end of it, that has a very short stroke. I do not know the exact formula or plan for the difference in power between the piston and the end of your ram.

Q. Well in the hydraulic ram that you are speaking of, is there any difference in area between the top of the piston and the point at which the pressure is applied?

A. Oh yes; the piston might only be half an inch in diameter, and the other end of the ram might be two or three feet.

Q. And that's the way you get your increase in pressure, by a difference in area, is that right?

A. Not necessarily in area.

Q. Well what makes the difference in pressure?

A. Water cannot be compressed. You have the same pressure at the—in half an inch that is spread over the area at the other end.

Q. Suppose we have a cylinder, with a piston in it, and the cylinder is full of water; and you apply a power to the piston, pushing down on the water; isn't it a fact that the pressure on the opposite end of the piston will be no greater than the force that you apply to the piston?

A. You are getting into hydraulics, and I am not a hydraulic engineer.

Q. Well Mr. Munroe you have been explaining to us the effect that you say you produced on this tank, and you attribute it to the principle of the hydraulic ram?

A. That's correct.

Q. And if that is so, you ought to be able to tell us about it?

A. I cannot explain to you all the workings of a hydraulic ram. I know that it exists; but I am not a hydraulic engineer.

Q. Can you tell us anything whatever about the principle of hydraulics, as to the forces that are produced, and how they act by the compression of a piston against a chamber filled with water?

A. I don't get your question at all Mr. Matteson.

Q. Well I am simply asking you for the underlying hydraulic principle that explains this hydraulic ram you are talking about. What is the hydraulic principle that is involved? How does it work?

A. I have told you what I know about a hydraulic ram.

Q. Well you have told us nothing; is that what you know?

A. No.

Mr. Underwood:

If your Honor please, I object to that as characterizing the witness' testimony. I didn't produce this man as a hydraulic expert in the first place, but to inquire about certain facts.

Mr. Matteson:

You certainly had him testify that he produced an effect known as a hydraulic ram, on this tank, and he attributed certain results to it.

The Court:

I don't see that there is anything for the Court to rule on.

Mr. Underwood:

I object to the last question, your Honor, as characterizing the witness' testimony.

The Court:

I overrule the objection.

(By Mr. Matteson):

Q. Put it this way: Do you consider that you have explained to us the principle of a hydraulic ram?

Mr. Underwood:

I object to what the witness considers he has explained. How does that help us to the conclusion of this case?

The Court:

Well he is on cross-examination, Mr. Underwood; I think the question is proper.

(By Mr. Matteson):

Q. Is there any further explanation of it you can give us?

A. I don't think I can.

Q. When a pressure is created by a piston in a cylinder filled with water, can you tell us how the resulting forces are distributed around the walls of the chamber and the opposite end? Any principle of dynamics relating to that?

A. I know that your pressure is equal on the bottom as well as on the sides.

Q. It is distributed over the bottom and the sides, is it not?

A. It is.

Q. And top as well?

A. No, not on the top. Of course you have the added weight of the water there.

Q. The distortion that occurred on the bottom of the tank was a great deal more than any displacement on the top of the tank, was it not?

A. There must have been more pressure on the bottom than there was on the top, otherwise it wouldn't bulge. You have the added weight of your water to help you out, so that you really have got more pressure at the bottom than you have at the top.

Q. The tank was completely filled with water?

A. The tank was in a vertical position.

Q. And completely filled with water?

A. Completely filled with water.

Q. And you noted this bulge on the bottom of the tank just after you had jumped on it; is that right?

A. After I had jumped on it. I then examined the tank all over; I had examined it just previous to my doing that, and I examined it again afterwards; and when— at that time I saw the bulge in the bottom, and you could see that it was freshly done by where it had loosened the galvanizing under the bottom of the tank.

Q. And it was subsequent to that, that you applied the riser test, was it?

A. It was before that— that was the last test I put on.

Q. That was the last test?

Mr. Underwood:

You mean, the jumping test?

A. The jumping test; the ram test was the last test I put on.

(By Mr. Matteson):

Q. Now do I understand that you examined the bottom of the tank just before what you call the ram test?

A. I did.

Q. And up to that time had there been no distortion of the bottom?

A. There was no distortion of the bottom.

Q. Now you have testified to some extent about hydrostatic tests of tanks. It is a fact, is it not Mr. Munroe, that one of the prerequisities for a satisfactory hydrostatic test of a tank, is that the tank should be thoroughly cleaned before such a test is made?

A. I don't know that that is; no.

Q. If that isn't done, any material that may be in the tank will be forced into the seams, will it not,—or it may be?

A. It may be forced into the seams, yes.

Q. And that would give a misleading resalt to your test, would it not?

A. All depending on what the material is that is in there.

Q. Now these tanks as they were originally constructed, as I understand it, had two inch outlets on the sides, at the top and the bottom; is that right?

A. There were two inch holes, bushings welded into the tanks, both top and bottom. Not in the top of the tank nor the bottom of the tank, but the sides at the upper and lower end.

Q. And that apparently was the way the tanks were constructed, was it not?

A. That is the way they were constructed originally.

Q. And a two inch opening would be very large for an outlet on a gasoline tank wouldn't it?

A. Yes.

Q. It would seem to follow from that, Mr. Munroe, would it not, that the tanks were probably not originally constructed especially for the purpose of containing gasoline?

A. I can't say that they were originally intended for gasoline, no. They were probably intended for multiple purposes.

Q. As a matter of fact they are identical with tanks that are ordinarily used for storage of water, are they not?

A. I wouldn't say that they are identical, but, very similar.

Q. Very similar?

A. —construction.

Q. And the large opening that we were just referring to is indicative of a water tank rather than a gasoline tank, is it not?

A. I wouldn't say that it was.

Q. I would like to ask you this question, Mr. Munroe. You have talked some about the drains on the trays under the tanks. If the level of the trays was below the water line of the ship, any drain leading from the trays over-

board would necessarily admit water back into the trays, would it not?

A. If the trays were below the water line, yes.

Q. Do you know what zinc plates are used for on the hull of a vessel like the Seminole?

A. I do.

Q. What are they used for?

A. To prevent electrolysis in the main hull.

Q. What is the cause of electrolysis?

A. Electrolysis is an electrical current that is set up between the iron and the bronze. If you have all iron you don't need the zinc plates. It is only where you have bronze fittings going through the iron, or bronze propellers; it is usually the bronze that the zinc would be taken out of the bronze, if you didn't have the zinc plates to eat up first.

Q. Where are zinc plates ordinarily placed on a vessel like the Seminole?

A. That depends. The majority of them are put near the propellers, usually on the hull; sometimes you see them placed on a strut, depending on where the greatest action takes place.

Q. Well they are placed anywhere in the ship where you find excessive pitting or corrosion, is that right?

A. That is correct.

Q. And that may be forward as well as aft?

A. They might be forward, they might be amidships, they might be aft.

Q. I mean, you didn't by your answer mean to suggest that the only place they are ever put is near a bronze propeller?

A. Oh, no.

Q. And as a matter of fact, if they are put on any other part of the vessel, where there are steel plates and steel frames, you haven't any contact with bronze and steel at that point, have you?

A. You won't need a zinc plate where you have steel to steel.

Q. Well the only place you would have bronze to steel, would be at the propeller, isn't that right?

A. Propeller, and the shafts.

Q. And that is in the after part of the ship?

A. Yes.

Q. And I think you just agreed that they are many times put in the forward part of the ship, as well as the after part of the ship?

A. You might have a bronze seacock fastened to a steel plating; none of it would appear on the outside, but yet there would be electrolysis set up between the bronze,—inside the plating.

Q. What I am getting at is this. It isn't the mere fact there is bronze against steel, that causes the electrolysis, is it? Isn't it the fact that there is an electric current, in addition to that?

A. There is a possibility of it, yes. But you get a greater amount of electrolysis where you have bronze or brass; any material that has zinc in it.

Q. Well it wouldn't occur in a vessel that had no electricity aboard her, would it?

A. No.—Oh, yes it would, too; I beg your pardon. It would.

Q. You think it would?

A. Yes indeed.

Q. But, it is aggravated, is it not, by the presence of electricity?

A. It is sometimes aggravated by the presence of a ground wire running,—even a radio wire running to the shaft.

Q. That has to do with stray current set up in the hull, is that right?

A. Due to a stray current, yes.

Q. What would you say would be a normal number of zinc plates for a vessel of the size of the Seminole?

Mr. Underwood:

If you Honor please, I object to that on the ground it is a hypothetical question, and sufficient facts are not stated.

The Court:

I will overrule the objection.

A. Now what was that question, again, please?

Mr. Botts:

Read the question.

(The last question was read by the reporter.)

A. I don't know that I can answer that question. There are too many things dependent on it.

Q. Well let me ask you this: When one of these zinc plates is applied, about what is its usual size and weight, in a vessel the size of the Seminole?

A. You can put them on various sizes; there is no standard size for them. You can get them any size and put them on any size you want, depending on the amount of electrolysis or action that takes place at certain points.

Q. Well ordinarily they are about a foot by a few inches are they not?

A. You can buy them in sheets that size, but they are not put on a vessel, that size.

Q. Usually smaller than that?

A. Oh, yes.

Q. Usually about what size, would you say?

A. Not over four by eight.

Q. And how much would a plate that size weigh?

A. I would only be guessing at it.

Q. Well approximately?

A. Four or five pounds, six pounds. It depends on the thickness of it. Usually about a half inch thick.

Q. Now if you found as many as a dozen such plates on a vessel like the Seminole, isn't it a fact that that would be an extraordinarily large number?

Mr. Underwood:

If your Honor please, I object to that as speculation. In the first place I didn't go into the zinc plate business at all. It isn't proper cross-examination at all. He is making him his own witness as to zinc plates. In the second place, how many zinc plates somebody might put on a vessel, might be because of electrolysis; it might be he wanted to guard against it,—although we haven't any evidence of it. It is purely speculative.

Mr. Matteson:

I think we are entitled to know what our opponents position is with respect to this zinc plate matter. We have some very interesting evidence in the case with respect to zinc plates; and one of the other witnesses testified with respect to them. Now I want to know what is indicated by the conditions that we have and know existed. I think it is fair examination.

The Court:

Did he testify about zinc plates?

Mr. Matteson:

No he hasn't testified about zinc plates, that is true. But it seems to me,—of course if they don't want to be interrogated about it why that is quite all right with me. It is evidence I will put on. I don't care to press it if Mr. Underwood doesn't care to have the witness testify.

The Court:

I think that technically cross-examination should be confined to matters gone into on the direct examination.

Mr. Matteson:

Of course I think I am entitled to a considerable degree of latitude.

The Court:
I think so too.

Mr. Botts:
If the Court please, as I recall it,—it has been so long since this witness' testimony was given; I recall the witness Simmon, as I recall it, stated that by this witness he was informed as to the use for these zinc plates. Now then this witness is presented as an expert, and I think in view of all those things that latitude ought to be allowed to find out what this witness knows, and really how much of an expert he is.

The Court:
Well I am disposed to allow the cross-examination, to test his knowledge, both along the lines gone into in direct examination,—it may be that it is competent. I am just in doubt there. I am going to rule on the safe side and allow this witness to answer. I am in doubt about it, but I will allow him to answer it.

(By Mr. Matteson):
Q. Do you have the question in mind, Mr. Munroe?
A. I would like to have it re-read again; there was so much other said that I can't remember; I don't want to answer without knowing what it is.

(The last question was read.)

A. That depends entirely on the size of the plates. If they were small, a dozen would not be too many.
Q. How thick are these plates? How thick is the stock from which these plates are made?

Mr. Underwood:
I object to that as speculative.

Mr. Matteson:
That is a standard matter.

Mr. Underwood:
There is no proof about the size of it.

The Court:
You asked about some particular plates?

Mr. Matteson:
No, sir. The plating for putting in the sides of ships, comes as I understand it, in a standard size. I think that is a fact; if not, this witness can testify that it isn't. I would like to know what that size is.

Mr. Underwood:
There is no proof about it.

Mr. Botts:
He has already testified the plates are usually about half an inch thick.

Mr. Matteson:
Did he testify to that?—Then I will withdraw the question.

Q. Did the Seminole have any intercoastal or other keelsons?

A. Not that I could see in her.

Q. Did you notice the condition of this stringer that ran along the port side, that we noted showed in this picture exhibit number 3? The horizontal, fore and aft stringer along the port side?

A. That which appears as a shelf? The deck line? The main deck line?

Q. Yes?

A. Yes I noticed that.

Q. Is that what you call the deck stringer? What name would you give it?

A. It would be a deck shelf there, or deck stringer. It is a strengthening frame.

Q. It is a strengthening fore and aft frame?

A. It would be a stringer.

Q. That runs the length of the ship on her port side, does it?

A. As I recall, I think it runs the full length on both sides.

Q. When we were out there in October, did you note the condition of that port deck stringer with respect to corrosion?

A. Well there are places at the present time where it is fairly rusted through, yes.

Q. But did you note by comparison, what the condition of the same stringer on the starboard side was?

A. No I don't think I did. I should say there were about equally corroded, though.

Q. Now you have spoken about the necessity of having gasoline in the engine room for priming engines. You are familiar with an approved type of safety can which is sometimes used in the engine rooms of gasoline boats, where a supply of gasoline is required for special purposes, are you not?

Mr. Underwood:

If your Honor please, I object to the question on the ground that it refers to an approved type of safety can. Approved by whom? If it is one of these rules, I object to it; rules have no binding effect on the respondent.

Mr. Matteson:

I will strike out the word "approved".

Mr. Underwood:

Just ask the question without the word "approved".

(By Mr. Matteson):

Q. You are familiar with a type of safety can that can be used for that purpose, are you not?

A. I am not.

Q. You have never heard of such a thing?

A. I believe they have such things, but I couldn't tell you what it looked like or how it operates.

Q. If such a thing were available, that would be a perfectly adequate means for having a supply of gasoline in the engine room without having draw-off valves attached to the feed line, would it not?

Mr. Underwood:

If your Honor please, I object to that. The witness is asked about something the existence of which he does not know about. He is asked to say if something would be effective that he doesn't know exists.

Mr. Matteson:

This man has testified among other things that it is perfectly proper, and in fact necessary to have draw-off valves for gasoline in the engine room. I certainly think I am entitled to cross-examine him to the limit on that point, about which I think there is no doubt whatever.

The Court:

Read the question now.

(The question objected to was read.)

Mr. Underwood:

If your Honor please, I refer to the phraseology at the outset of the question, "such a thing"; and suggest that the previous two questions and answers be read, so that you will know what the reference is.

Mr. Matteson:

Suppose I reframe the question. I think we are wasting time.

The Court:

All right.

(By Mr. Matteson):

Q. If there were a type of safety can which could be filled ashore and kept in the engine-room as an available supply for priming the engines, there would be no necessity of having draw-off valves on the gasoline line in the engine-room, would there?

Mr. Underwood:

I object to that as speculative. What kind of can is it; what are its dimensions; what can is it; produce one.

Mr. Matteson:

All right. The question is: If there is a type of safety can which can be filled ashore and kept in the engine-room as a supply of gasoline for priming the engines, there would be no necessity of having draw-off lines on the gasoline lines in the engine-room as a means of supplying gas. I think that is perfectly all right; I think we are entitled to ask that.

Mr. Underwood:

I object on the ground that there is no proof of such thing; there is no proof of the material; there is no proof of the dimensions or the means of use. How much does it cost, and just what is it. I think we ought to at least know what the subject of the question is.

The Court:

As I understand it, the purpose of the cross-examination is to elicit from the witness whether it is, within resonable operation of the boat, proper to use a can filled ashore with gasoline and keep it in the engine-room. I don't think that question tends to elicit that. I will sustain the objection to that question.

Mr. Matteson:

If your Honor please, I do not care to press it, but I want to make my point clear. This witness has testified that it is a proper and necessary thing to have draw-off valves on a gasoline line in the engine-room, and he says the reason for that is because it is necessary to have gasoline in the engine-room to prime the engines. Now I am suggesting an alternative means by which that result can be reached, and asking him if that means is available, if that would not eliminate the necessity of having these draw-off valves. I think we are entitled to have an answer to that question.

The Court:

I think that is entirely proper.

Mr. Underwood:

But that was not his question.

The Court:

Suppose you restate your question, because I think your point is well taken.

(By Mr. Matteson):

Q. Now, Mr. Monroe, I will put it this way: I think you have said that draw-off valves on a gasoline line in an engine-room are proper on a vessel on the type of the Seminole, because of the importance of having an available supply of gasoline for priming the engines. Do I undestand you correctly on that?

A. I believe that is the way I stated it.

Q. Now, if there were available a type of safety-can which could be filled ashore and kept in the engine-room as a supply of gasoline for priming the engines, then there would be no necessity of having draw-off valves on gasoline lines in the engine-room, would there?

Mr. Underwood:

I make the same objection; it is the same question; it refers to a type of safety can. What kind of a can is it; we don't know its size; we don't know its shape, and we don't know how much it will hold. We don't know anything about it. The question is, as I understand it: If you have a safety can, and enough of them, would you have to draw off gas from the tanks to prime the motors?

The Court:

It seems to me that the answer to the question is obvious, but I think he is entitled to ask the question: If you had a safety can that could be filled ashore, would it be necessary to have a method of drawing off gasoline from the tanks inside. It seems to me that that is obvious.

Mr. Anderson:

He asked, if your Honor please, if it wasn't necessary, would it be necessary?

Mr. Underwood:

My objection is to the reference to this type of safety can. What is it? I think the witness is entitled to have more information than Mr. Matteson's conclusion that there is such a can.

The Court:

The way I construe it, I think the answer is obvious, but I will let him answer the question. The question supposes something that has not been brought out yet. It is a hypothetical question, the hypothesis of which has not been established, as I understand it, at least by this witness.

Mr. Matteson:

I agree with you. We cannot do everything at once. This witness is going away, and I would like to ask him now—

Mr. Underwood:
Why do you say this witness is going away?

Mr. Matteson:
This witness won't be here.

Mr. Underwood:
This witness will be here.

A. I don't know how to answer that question. If the can was safe enough to meet the requirements apparently set up by some insurance company, you would not be able to get gasoline out of the can.

Q. Do I understand that you never heard of such a type of can?

A. I never—

Q. And the type of can—

Mr. Underwood:
I object to that—

The Court:
The objection is well taken. We don't know what can you are talking about.

Q. I will refer you for a moment, Mr. Monroe, to the text of paragraph "M as in Mary" on page 48 of Libelants' Exhibit 97, and ask you if you will just read that and tell me if you are familiar with the type of safety can referred to there?

A. You say paragraph "M"?

Q. Yes.

Mr. Underwood:
"M" for Mary?

Mr. Matteson:
That is right. You will have to read to the end of the paragraph.

Mr. Underwood:

We object to that question because it does not describe the kind of thing Mr. Matteson has in mind. It doesn't describe any can at all. It says: "Only approved safety cans filled at the station". What is an approved safety can. I don't know that the witness knows, and the question certainly does not say.

Mr. Matteson:

I am asking the witness if he is familiar with any such type of can.

Mr. Underwood:

What type of can; what are the dimensions and the specifications of this can; what is the secret?

Mr. Matteson:

There is no secret about it.

Mr. Underwood:

There certainly is in this question.

The Court:

What is the question, Mr. Colman?

(Thereupon the preceding question was read by the Reporter as above recorded).

Mr. Underwood:

I object on another ground, that it refers to the use of carrying gasoline for auxiliary units, and not for the main engine.

The Court:

I will sustain the objection.

(By Mr. Matteson):

Q. Well, I will put it this way, Mr. Monroe: do I understand that you know of no type of safety can which would be suitable for such purpose?

Mr. Underwood:

I object to the question on the ground that it has the word "safety" in it. What is a safety can; what are its dimensions?

Mr. Matteson:

I asked him if he knows any type at all.

Mr. Underwood:

What is a safety can?

Mr. Matteson:

Ask him.

Mr. Underwood:

What one man might call safe, he might call unsafe.

The Court:

You can ask him if he is familiar with (knowing these specifications)—if he can describe a can that will measure up to these specifications; you can ask him if he is familiar with any type of can on the market that measures up to that.

Mr. Matteson:

That is substantially what I have asked him.

The Court:

All right.

(By Mr. Matteson):

Q. Are you familiar with any type of can which you would consider safe and suitable for the purpose that we

have mentioned, that is, for maintaining a supply of gasoline in the engine-room for priming the engine?

A. I don't know that I have ever seen one.

Q. After reading this rule that I called your attention to, "M" on page 48, do you have any doubt that such a can exists?

Mr. Underwood:

I object to that, if your Honor please—

The Court:

I think that is arguing with the witness. I will sustain the objection.

Q. You would not say, I take it, Mr. Monroe, that such a type of can does not exist?

Mr. Underwood:

I object to that; that is arguing with the witness. You have to bring this trial to an end some day. You have been very patient with questions of this sort. If he wants to prove that such a can exists, let him do it with his own witnesses.

Mr. Matteson:

I want to know whether this witness knows if there is such a thing in existence.

By the Court:

Q. Is there on the market to your knowledge a can that would measure up to these specifications, or can you describe a can that would measure up to these specifications?

A. I don't know of any can that measures up to that description. There must be something that is known as a safety can, but it is not generally sold on the market to my knowledge.

Q. Well, you have examined the hull there of the Seminole: are you of the opinion that gasoline was drawn off from these tanks for the purpose of starting the engines?

A. I am of the opinion that gas was drawn off through these valves into a squirt can for the purpose of priming the motors.

Q. From what you saw, are you of the opinion that gasoline was drawn off from these tanks for the purpose of putting gasoline on auxiliary boats, or do you know that; do you have an opinion about that?

A. I only know from what testimony was given by the various captains and engineers on that boat—

Q. Not from the testimony, but from what you saw. Is it your opinion that it was done; did you see enough to form an opinion about that?

A. I did not see enough to form an opinion that it was done.

Q. Well, assuming now, from what you saw, you are of the opinion that gasoline was withdrawn through these draw-off valves for the purpose of starting the engines, do you know of any other method by which gasoline could have been obtained for that purpose and kept there on the Seminole; was there any other safe way of doing it; assuming that it was necessary to have gasoline there in the engine-room for the purpose of starting the engine, was there any other safe way of doing it, or what would you say was the safe way of doing it,—I will put it that way.

A. There are other considerations, of course; of course, the safest place on the boat to keep gas is to keep the tank on deck, and only bring it down in very small quantities; but, as I stated in previous testimony, there were times when the gasoline had to be gotten in a hurry, and the engineer wouldn't have time to go on deck to get it, therefore, I feel that it was a better risk to have it in there handy, rather than to have the man go up on deck to get it.

Q. Well, assuming that it was desirable from good engineering standpoint and operation of a boat that gasoline not be kept on deck, and that gasoline was withdrawn in the usual operation of the boat from the tanks for that purpose, what other method would there have been of retaining or keeping gas there for that purpose in the engineroom?

A. The only other place to keep it in the engine-room would have been in a separate container.

Q. Is that a tank?

A. Drum.

Q. Like an open can?

A. Well, not necessarily an open can; I would not put it in an open can, but it would be a tank, a 50-gallon drum, or a 55- gallon drum, or even a smaller quantity, but there would be just the same chance of leakage to get that gas out of there as there would be in any other one.

Q. What is the comparison between the method of keeping gas in the engine-room that you have just described and obtaining it from the tanks; the tanks that you know to have existed there.

A. I don't know that there would be any advantage.

Q. No preference, one over the other?

A. No preference, one over the other.

Q. You mean by that, Mr. Monroe, if gas was kept in drums of a smaller capacity than these tanks that were used, that that would be just as safe as to withdraw the gas from the tanks that were installed?

A. Yes, just as safe as if drawn from the main tanks.

Q. That drum that you spoke of as being just safe, would that be a drum as free from contact with the air as the tanks that were installed and you know to have been on the Seminole?

A. You mean free from any leaks?

Q. No; I mean with reference to keeping them closed up, keeping the tanks or drums closed except for vents.

A. The drum I had in mind is the same type that is used for the transportation of it; you would have to put a vent into it.

The Court:
All right; that is all I have to ask.

(By Mr. Matteson):
Q. A vessel of the type of the Seminole is not subject to any governmental regulations with respect to gasoline tanks installation, is it?

Mr. Underwood:
I object to that as a question of law.

The Court:
If it is a question of law, I don't know—maybe the witness can help me.

Mr. Underwood:
I don't see why the witness should be expected to know it.

The Court:
He might enlighten the Court; I am willing to have all the information you can give me.

(By Mr. Matteson):
Q. Is it or is it not, Mr. Monroe?
A. Is it or is it not what?
Q. Is a vessel of the type of the Seminole subject to any governmental regulations with respect to installation of gasoline engines and tanks?
A. To the best of my knowledge she was not.
Q. Now there are commercial vessels which are subject to such regulations, are there not?

Mr. Underwood:

I object to that is utterly immaterial.

Mr. Matteson:

I think I will bring out the materiality of it in just a moment.

The Court:

I will overrule the objection.

A. To the best of my knowledge a vessel used for transportation of passengers is subject—that is, over a certain size, and I believe that she would come in—

Q. With gasoline engines?

A. Even with gasoline, Diesel or any other.

Q. And for cargo carrying, too?

Mr. Underwood:

I object to that. He is arguing with the witness; he is trying to elicit from him an opinion on what the law is. It is utterly absurd. We have to finish the trial of this case some day.

The Court:

The objection is overruled.

(By Mr. Matteson):

Q. Vessels carrying cargo are subject to such regulation, too?

A. I don't know that I am conversant enough with these rules—I don't know as I know these rules sufficiently to testify about cargo vessels—

Q. Now is there any reason that you can think of why draw-off valves on gasplines would be any less safe in a commercial vessel than a yacht?

Mr. Underwood:

I object to that; it is the same old thing: arguing with the witness. I respectfully suggest that this is argumentative, and it doesn't get us anywhere.

(Legal Discussion).

By the Court:

Q. Mr. Monroe, if this vessel was used for commercial purposes and not for private purposes, would it be subject to any different rule as to having that method of drawing off gasoline?

Mr. Underwood:

If your Honor please. I hate to object to your Honor's question, but when you say "subject to any different rule", do you mean statutory law or regulation of an official body or any rule of prudence?

The Court:

I mean as to statutory governmental rule or regulation. If this vessel was used for commercial purposes, would it be subject to any governmental rules that you know of that it would not be subject to as a private vessel?

A. Yes, sir; she would come under the steamboat classification.

Mr. Underwood:

If your Honor please, I think perhaps Mr. Matteson and I can agree on that; if she was carrying passengers for hire, she would be under certain governmental rules. At the time of this fire my recollection is—although I am not certain—that these rules did not exist, but if she had been then carrying passengers for hire she would not have been subject to any governmental regulation.

Mr. Matteson:

I think you are laboring under a misapprehension as to the rules I am talking about.

Mr. Underwood:

Perhaps I am; you have been very careful not to let anybody know what they are. Do you want to show them to me now?

Mr. Matteson:
Yes.

By the Court:
Q. Getting back to the time this vessel was destroyed, was she subject to any governmental rules if she had been used for commercial purposes that she was not subject to as a private vessel?
A. I don't know that I could tell you at that time; I believe she comes under it now, or would come under it now, but if it was in existence then, I don't know.

The Court:
I think, Mr. Matteson, that you must first establish by this witness that a different rule applied to another character of vessel before you ask him why it should not apply to a private vessel.

Mr. Matteson:
That a different rule applies to another type of vessel?

The Court:
Yes.

Mr. Matteson:
Yes.

The Court:
He says he doesn't know. He says that at the time the Seminole was destroyed he doesn't know if there was any rule in existence if it had been used for commercial purposes.

(By Mr. Matteson):
Q. I show you these rules of the United States Department of Commerce; general rules and regulations prescribed by the Board of Supervisors relating to tank

vessels, and I call attention on page 17 to Rule ~~11~~-5-6, sub-section "C", relating to gasoline fuel piping under "installation of gasoline engines", and I call your attention to the fact that this regulation provides that no outlet for drawing of gasoline shall be permitted in engine compartments, and ask you if you can suggest any reason for a different standard in that respect with respect to vessels to which theses rules apply; than with respect to the yacht Seminole?

Mr. Underwood:
I object to the question; the rules refer to tank vessels, that is, vessels which carry oil in tanks.

The Court:
Is that true?

Mr. Matteson:
Yes.

The Court:
Here is the way I view this: I think on cross-examination it should be first established that there are some government rules which would be applicable to the type of vessel that the Seminole was, and then, if you can establish what those rules are, you can ask this witness as to why—you can ask him does he know of any reason why these same requirements should not be observed in the installation of equipment and operation of it in connection with pleasure craft. Now it appears that this question incorporates a standard applying to a type of vessel that the Seminole was not.

(By Mr. Matteson):
Q. I will put in this way: if the Seminole were used as a tank vessel, would your answer be any different with respect to the propriety of having gasoline draw-off valves in the engine-room.

Mr. Underwood:

I object to that as speculative, if you Honor please; that is no part of this case at all.

The Court:

I don't think it appears that this vessel could be used as a tank vessel.

Mr. Matteson:

Any vessel could be used as a tank vessel.

The Court:

You mean for carrying cargo, for carrying a cargo of oil?

Mr. Underwood:

It would have to be rebuilt at a cost of $75,000.00

Mr. Matteson:

It can be done—

The Court:

I don't think that, Mr. Matteson.

(By Mr. Matteson):

Q. Is your reason for saying that draw-off valves are proper on the Seminole the fact that she was used as a yacht?

A. I don't think that that would change my opinion on the matter at all.

Q. It would not make any difference what purpose she was used for, in your opinion?

Mr. Underwood:

I object to that; it is the same question that I objected to before.

The Court:

I think that that is proper cross-examination. I don't think that is the same question. I will overrule the objection.

A. It depends on what the vessel is being used for.

Q. Well, in what kind of use would you say it was improper to have draw-off valves in the engine-room?

A. You mean the type of cargo that she was carrying?

Q. I am leaving it entirely open and up to you.

A. I don't know that it would be entirely improper even for a vessel carrying gasoline—for tank vessels—

Q. You think it would be proper?

A. It could be done with safety, yes.

Q. That is your opinion?

A. Yes.

Q. In other words, I will put it this way: if a vessel were reconstructed and made into a tank vessel carrying gasoline in tanks, you still think it would be proper for it to have draw-off valves on her gas-lines in the engine-room?

Mr. Underwood:

I object to that as speculation, and it is also repetition.

The Court:

I will sustain the objection. The question involves "reconstruction"; I think we should confine it to the vessel as it was.

Mr. Matteson:

If your Honor please, what I am trying to do is to test the knowledge of the witness. I want to find out whether it is based on the—

The Court:

In your question you bring in the idea of reconstruction.

(By Mr. Matteson):

Q. Do I understand you to say that it might be safe or unsafe according to the type of use the vessel was put to?

A. No, not necessarily.

Q. Do I understand you to say that it would be safe in any case?

A. It could be safe in any case, yes.

Q. What do you mean, "it could be safe"?

A. The manner in which it was used.

Q. In other words, it depends on the use of it, is that right?

A. Yes, it does.

Q. In what particular?

A. Well, the person who uses it is really what I mean, the care in which it is used.

Q. Its safety depends on the personal element, then is that right?

A. Yes, it depends on the personal element; in fact, everything we do depends on the personal element. If you walk down the street you run the chance of somebody dropping a brick on you from a building; it would be safer to stay at home.

Q. Did you bring with ~~you today your~~ volume of Kent's Mechanical Engineer, Kent's Engineering Handbook?

A. I have my volume with me, yes.

Q. May I see it?

The Court:

We are getting into something else now. I want to sign my mail and catch the 5:30 bus.

(Thereupon an adjournment was taken to 9:15, November 14, 1939).

Tuesday, November 14, 1939, 9:24 o'clock a. m.

Hearing was resumed pursuant to adjournment; and

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Cross Examination.

By Mr. Matteson:

Q. Just one more question, Mr. Munroe, along the line that we were talking of last night. I understood you to say that in your opinion the question of whether a draw off valve for gasoline, in the engine room, is proper, and was safe or not, depended on the type of vessel. And when I asked you in what type of vessel it was unsafe, I understood you to say that it depended upon the person who was handling it. Now what I would like to ask you is whether you still say that it is dependent on the type of vessel, or whether you confine your opinion to the man who is handling it.

A. Well principally I would say, on the man that is handling it.

Q. You don't make any distinction between types of vessels then?

A. No.

Q. Was that question answered?

A. I answered, No.

Q. Now I would like to show you this can, and ask you whether in your opinion that would be a suitable can for maintaining a supply of gasoline in the engine room of a vessel such as the Seminole, which might be needed for priming.

A. I have seen such cans as these, before. I have never considered them as being a safety can, though— any safer than any other can.

Q. Well why wouldn't that be a practicable method of maintaining a supply in the engine room for priming?

A. The possibility of leaks with this can is just as apt to occur as in any other type of can.

Q. I suppose in any can there may be flaws in manufacture, but is there anything about the type of can that you would consider unsafe?

A. I don't know that I can say that it is any more unsafe than any other can.

Q. Well do you consider it would be unsafe, that type of can?

A. I don't consider that any can is unsafe.

Q. Well then you consider that would be a safe method of keeping gasoline in the engine room, do you?

A. You could keep gasoline in that can, yes.

Q. And that would be safe?

A. I wouldn't say it would be any safer than any other container.

Q. If the can were properly constructed and free from flaws, would you consider it safe?

A. No more than any other can that was properly examined and free from flaws.

Q. Well would you consider any can safe?

A. Yes, any can would be just as safe; a squirt can is just as safe.

Q. Did you bring your volume of Kent this morning?

Mr. Underwood:

Are you going to offer that can?

Mr. Matteson:

Yes; I will mark it for identification.

Mr. Underwood:

May I look at it?

Mr. Matteson:

Surely.

(Said gasoline can was marked as Libelants' Exhibit No. 137 for identification.)

Q. Did you bring your volume of Kent with you this morning?

A. Yes, sir. This happens to be in two volumes; I think it is the same as the one you have there, only it is in two volumes.

Q. This is Kent's Mechanical Engineers' Handbook, Volumes One and Two, 10th Edition, 1923; is that right?

A. That's correct.

Q. And you regard this as an authoritative treatise, do you?

A. Regard it as what?

Q. Do you regard these books as an authoritative treatise on the subjects they cover?

A. Absolutely.

Q. Is this the same volume that you had with you in Court before?

A. That's the same two volumes.

Q. Do you draw any distinction between fuel oil tanks and gasoline tanks, as to construction?

A. There is practically no difference between fuel oil construction,—that is if you are talking about distillate, now. If you are talking about fuel oil, bunker oil, bunker oil and gasoline, there is a difference. But between distillate and gasoline there is no appreciable difference.

Q. And distillate comes under the head of Fuel Oil, does it?

A. It is a light fuel oil; yes, sir.

Q. I notice the heading of 'Storage of fuel oil', page 888 of Volume 1, reference is made to the regulations for fuel oil storage published by the National Board of Fire Underwriters. Apparently such regulations are recognized by this authority; is that right?

Mr. Underwood:

I object to that. I object to asking this witness what this authority, this book, recognizes. Mr. Kent himself is the best evidence of that.

Q. Well, do you also recognize the regulations of the National Board of Fire Underwriters, as standard for fuel oil storage tanks?

Mr. Underwood:

I object to that unless the type of tanks is specified in the question. What type of fuel oil is to be put in these tanks?

The Court:

Do you recognize that as a good objection?—I haven't ruled on that; do you want—

Mr. Matteson:

I am not going to press the question.

Q. Are you familiar with the later edition, the 11th Edition of the same work?

A. No, sir; I haven't seen the later edition.

Q. This treatise in all its editions, is regarded as standard, is it not?

A. I believe it is considered as the standard handbook of mechanical engineers.

Q. Now one more question: I think—

A. I might add further to that, that it is not the only handbook for engineers.

Q. You suggested at one stage of your testimony that there was some difference in the standards to be applied to yachts in Florida and in the north. It is a fact that yachts are chiefly used in Florida in the winter time and in the north in the summer time, is it not?

Mr. Underwood:

I object to that as immaterial. It is recognized, I will admit, that a lot of yachts are used in the north in the summer and in Florida in the winter. 'Chiefly', I don't know, and I don't think anybody knows.

The Court:

Well I will overrule the objection. It may be material; I will have to see.

Q. Is that the fact?

A. There are a great many of the vessels or boats that are used here in Florida in the winter time, and in the north in the summer. But there are also a great many of them built solely for Florida use. The Seminole I believe was one of them.

Q. Well, do you say that there is any substantial difference between the climatical conditions when yachts are used in the north in summer and Florida in winter?

A. There is a great deal of difference between climatical conditions in Florida in winter and the north in the summer.

Q. What do you say is the difference?

A. Here in the winter time we don't have the heavy moistened air that they have in the north in the summer time in certain localities; they have a great deal more fog up there, which indicates moistened air.

Q. That is the chief difference that you think of?

A. That is the principal difference, at the time, yes. We have much warmer—our average temperature is much higher here in the winter time than it is in the north in the summer.

Q. When you examined the tank that was removed from the Seminole last May, did you find any evidence of the lower crown of that tank ever having been removed?

A. The lower crown?

Q. Yes.

A. I couldn't see—I think it would be very hard to tell whether the lower crown had ever been removed.

Q. You could see no evidence of it?

A. I could see no evidence of it.

Mr. Matteson:

That is all.

By Mr. Botts:

Q. Mr. Munroe, will you tell me, please, what your scholastic education consisted of? Are you a college bred man, sir?

A. I have had some college work, yes.

Q. Where and when, and how much?

A. I had some work in Columbia University in New York.

Q. When?

A. Summer school; 1924 and '5, I believe.

Q. How long were you there?

A. I was there two years; two summers.

Q. Two summers. You are a high school graduate?

A. I am.

Q. Miami High?

A. Miami High.

Q. And what was the nature of that technical—or that training that you took in Columbia University in the summer time?

A. Principally civil engineering.

Q. And what would have been the subjects that you studied there?

A. Well it was mostly field instruction in civil engineering, and laying out bridges, highways, railroads.

Q. Well it had—

Mr. Underwood:

I don't think he has finished.

A. Geodetic surveys; all types of land surveys.

Q. Had nothing to do with boats?

A. Had nothing to do with boats.

Q. Such special knowledge as you may have with reference to boats and their construction, has been gained, as I understand it, entirely from your contact with the construction of boats, principally here in Miami; is that correct?

A. That's the principal education, you might call it, yes. My knowledge has been gained in that manner.

Q. When you were in high school did you study physics?

A. I did.

Q. One year?

A. Whatever the course was. I believe it was one year.

Q. Chemistry?

A. Chemistry.

Q. One year?

A. Yes, sir; whatever the requirements were at that time.

Q. When did you graduate from high school?

A. Nineteen twenty-one.

Q. Have you ever worked on the construction of a steel boat?

A. No, sir.

Q. Your experience has been in the construction of small wooden hulled boats?

A. The actual construction, yes. But I have seen a great many steel boats built; been in yards where they have been there—where they were under construction; but I didn't actually work on them.

Q. You weren't engaged in construction on them, so your observation with reference to those would be merely more or less casual?

A. Well I wouldn't say it was casual.

Q. Well if you didn't work on them—

A. No, but when I go into a yard like that, I go in with the idea of learning something, by observation.

Q. You looked at them, then?

A. I looked at them, and talked about them. When you go to college you don't actually work on anything.

Q. Now, in referring to these tanks on the Seminole, and the overflow pipe, you made the statement, as I recall it——and I want to say I am depending entirely on my memory; it has been some time ago, so that if I don't recollect exactly what you said, please correct me, because it is just impossible—I haven't had access to a copy of your testimony, and it is impossible for me to be certain of my memory at this time, as probably it is with you. So as I recall it, you stated that this small overflow pipe was in your judgment safer than a larger one would have been. Is that correct?

A. I believe that was the gist of it. I stated that it was not necessary to have as large a vent pipe as a filler pipe.

Q. But you stated also that the smaller pipe was safer and better, didn't you?

A. I don't know that I used the word, safer. I may have, but I don't recollect having used the word, safer.

Q. Don't you recall, Mr. Munroe, that you said it would be either better or safer, because it would not permit the entrance of as much moisture into the tanks?

A. I believe I used the words, better.

Q. Well it may have been better or safer, but the thought that you gave us, as I recall it, was that the smaller pipe would restrict the entrance of outside moisture-laden air, and therefore for that reason be better; is that correct?

A. Yes, sir; I did make that statement.

Q. Yes; all right. Now then what would cause the moisture-laden air to enter the tank through this overflow pipe?

A. Due to the difference in temperature, between the day temperature of the air and the night temperature.

Q. Now isn't it true that if the pipe was large enough to allow a sufficient quantity of air to enter the tank, the air that entered would be equally moisture-laden whether it came in through a large or a small pipe? Wouldn't it?

A. No, sir.

Q. Now just a minute; do you mean to tell me that if we had two pipes, going to the outside atmosphere, and through each of those pipes the outside air was conveyed into a tank, that there would be a difference in the amount of moisture in the air sucked in through a larger or a smaller pipe, either of them coming from the same outside atmosphere? Do you mean to tell me that?

A. Yes.

Q. Which would bring in the most air—more moisture-laden?

A. The larger pipe. The larger pipe has the greater capacity.

Q. But if you brought in the same amount of the same kind of air, it wouldn't make any difference in the amount of moisture brought in in that air, whether it came in through a large or a small pipe?

A. The same amount of air would enter through either pipe, but it would take longer to do it through one pipe than the other.

Q. Then when the air finally got into the tank, there would be the same amount of moisture brought in, whether it was brought in through a large or small *tank*, wouldn't it? In other words, if a gallon of air came in through the large pipe, or through the small pipe, it would bring in the same amount of moisture, wouldn't it?

A. Yes, it would; theoretically it would; practically it doesn't.

Q. Now why do you say that? You are an expert; now tell me, give me some expert reason why that answer is true, if you can.

A. Well for the first place, I have handled a great many gasoline tanks.

Q. Did you ever measure the moisture content of the air that came into either of them? Are you capable—do you know how to measure the moisture content of the air?

A. Yes, I know how to measure it.

Q. How would you do it? Tell me, if you know.

A. You can get—

Q. Tell me how you would do it; you say you know.

A. Do you want me to manufacture you the instrument?

Q. You are an expert, you say you know that would be true; I want you to tell me how you know.

A. I know it is true, but I am not an expert on the manufacture of those instruments.

Q. Tell me how you would measure the difference in the moisture content of the air; that is what I asked you. You are an expert.

The Court:

Just let him answer the question, Mr. Botts. That is in the record that he is an expert, now.

Mr. Botts:

That he says he is an expert.

Mr. Underwood:

Mr. Botts has said he is an expert.

A. I am not an expert on that particular line.

Q. Then your judgment on that is a guess, just like mine would be, isn't it?

A. No, sir; it is not a guess.

Q. Well if you are not an expert, then how do you know?

A. I remarked that I had handled a great many gasoline tanks; a great many boats.

Q. How does that tell you how much moisture comes in through the air?

A. I don't have to guess; I know it is in there.

Q. You have made the statement that the air coming in through a smaller pipe would have less water in it than if it came in through a larger pipe.

A. I qualified that and said it would be the same amount.

Q. —Moisture.

A. But it would take longer to get it in there.

Q. Then do I understand you to say now that if the air—the same amount of air came in, supplied from the same outside source, that there would be exactly the same amount of moisture that would come in through air brought in through a small pipe as there would through the same quantity of air brought in through a larger pipe? Do you still say that, or do you stick to your other statement?

A. I don't get what you are driving at, Mr. Botts.

Q. All right, let's start over again. Suppose that you have a quarter inch pipe, running out this window into the air in its present condition as to moisture content; and you have a three inch pipe, or a two inch pipe, running out the window to the same supply of air; and you bring in one, two or five or whatever number you please, of gallons of air through the small pipe and through the large pipe. Will there be any difference in the amount of moisture in the air which is brought in through the large pipe or through the small pipe?

A. No, there actually will be no difference in volume; there will be a difference in time.

Q. All right then, you want to change your statement that you made a while ago, do you, that there would

theoretically be no difference but practically there would? Do you want to change that answer?

A. No, sir. There are other reasons why the moisture doesn't get into the tank.

Q. Now let's see if I have got you correct on this one proposition: that if the air came in through a quarter inch pipe or through a two inch pipe, from the same outside source, that the moisture content of the air would be identical whether it came in through the small pipe or the large pipe?

A. That is what I say; yes.

Q. That is what you now say; all right.

A. I said it before, too.

Q. All right, the record will show. Then is there any other reason now which you in your expert opinion can give us, why you say a smaller overflow pipe would be superior to a larger pipe, other than the element of the air bringing in moisture?

A. Yes, there is another reason.

Q. All right, why?

A. In the first place the vents is to carry off the air in the tank while it is being filled. Air will naturally compress; fluid does not compress as much, as a very small amount, of compression; air will compress a great deal. Therefore you can use a smaller pipe, and have the air pass off as fast as the fluid comes in through a larger pipe. Another reason—

Q. Wait a minute; why does that make it better? If the air gets out, it is out; why does it make any difference whether it goes out through a large or a small pipe?

A. If you will let me finish my answer, Mr. Botts, I will tell you. The reason for a small vent is to prevent quantities of gasoline fumes from passing over the side and out of the gas tanks.

Q. Well is there any disadvantage in having the gas fumes escape overboard, outside of the vessel, or do you want to keep them in your tank?

A. You need to keep the gasoline in your tank.

Q. I say, your gasoline fumes.

A. Yes.

Q. All right.

A. Your gasoline will become dilute, will not be as high quality after the fumes have passed off of it. So to keep your quality of your gasoline up to standard you can't leave it in an open container.

Q. All right; do I understand that you now abandon your original explanation as to why the small pipe is better than a large one, since we have agreed—

A I have not abandoned anything, Mr. Botts.

Q. All right; you have changed your testimony in that respect, anyway.

A. No, sir; I have added to it.

Q. Now then don't you know as a matter of fact that sufficient air can come in to equalize the air pressure on the inside and the outside, whether the pipe is half an inch or two inches?

A. Certainly air can enter, the same as it went out; equalize the pressure.

Q. And even if it was a quarter inch pipe, the air would come in fast enough to equalize any change in pressure due to temperature, in all of these four tanks, through a quarter inch pipe, couldn't it?

A. You could put a pinhole in there if you wanted to, and allow enough time for it. There is a factor of time in there, Mr. Botts.

Q. Oh yes; I am going to get at that and see what you know about it, in just a minute; that is what I am leading up to. What is the coefficient of expansion of air in a tank, do you know?

A. I know that there is a coefficient in any place, regardless of a tank. There is one part in 491., coefficient: 491.6.

Q. What do you mean by that?

A. For every degree above 32 degrees, a change of temperature.

Q. And you say it is 491.

A. Well to explain it so you can understand it—

Q. I understand it thoroughly without your explanation.

A. Well then I won't say.

Mr. Underwood:

That might be another issue in the case.

Q. But I want you to tell me where you get the coefficient of 491. Have you got your authority there? See if you are not wrong.

A. Right there.

Mr. Underwood:

Do you want him to look?

Mr. Botts:

Yes.

A. In this volume it is on page 655.

Mr. Underwood:

Let him read it, please.

A. May I read it?

Q. Yes, sir.

A. Air expands 1/491.6 of its volume at 32 degrees Fahrenheit, for every increase of one degree Fahrenheit, and its volume varies inversely as the pressure.

Mr. Underwood:

Let's get that fraction right in the record; one over four hundred ninety-one and six-tenths. Have you got that right, Mr. Bryant?

The Reporter:
Yes, sir.

Q. Now then if there was a change of one degree in the temperature, in these tanks, there would then, according to that table, be a change of volume of one gallon of air for every 491 gallons capacity of the tank, wouldn't there?

A. That's correct.

Q. Then for a change in temperature of one degree in these 600-gallon tanks, there would be roughly one and a half gallons of air?

Mr. Underwood:
I think it is a 500 gallon tank instead of 600.

Q. Were they 500 gallon tanks? Then if these were completely empty, then there would be a change of roughly 231 cubic inches of air that would be required to equalize for the outside temperature, for every degree of temperature, wouldn't there?

A. According to that, yes.

Q. What do you say about the length of time it would take 231 cubic inches of air to go through a half inch pipe?

Mr. Underwood:
May I object to that question, on the ground that the pressures are not given. What is pushing this air?

Mr. Botts:
Atmospheric pressure; I am speaking of atmospheric pressure; that is what we are talking about.

Mr. Underwood:
If your Honor please, if you have air in a compressed air tank, 200 pounds behind it, it will take one length

of time. If you have air in a tank with no pressure behind it except that incident to the change in temperature, it will take another length of time. Now how much pressure is behind this change of air? I think the witness ought to be given that; it isn't a fair assumption otherwise.

Mr. Botts:
Oh, counsel is just trying to be foolish, and succeeding very well. He knows we are talking about atmospheric pressure.

Mr. Underwood:
I think it ought to be incorporated in the question, so it can't be referred to otherwise.

Mr. Botts:
What are we talking about.

The Court:
Is it an artificial pressure?

Mr. Underwood:
That is what I don't know; it isn't in the question.

The Court:
I assume it means ordinary pressure without any artificiality.

Mr. Botts:
We are discussing the equalization of air in these tanks and out of these tanks; and counsel knows perfectly well; he has just tried to make a foolish question, and succeeded.

The Court:
Can you answer that question, assuming that there is no artificiality in the pressure, Mr. Munroe?

A. If you are figuring the outside pressure at normal atmospheric pressure.

The Court:

You can answer the question?

A. I don't know that I can give him the exact figures.

The Court:

Well is the question, whether you can answer it or not, is it a reasonable question to you, with that hypothesis?

A. I would say it was reasonable.

The Court:

All right; I overrule the objection.

Mr. Underwood:

May we have the question read, please.

(The question was read by the reporter.)

Mr. Botts:

At atmospheric pressure; add that to it; at sea level.

A. Offhand I can't tell you that, because it depends on——I don't know offhand what the volume of a half inch pipe is; I don't carry that around in my head, and I would have to figure the friction.

Q. Could you figure the friction? Do you know how to figure the friction?

A. It is right in that book.

Q. Well you don't know how to figure it then, do you?

A. Do I have to know? There is tables in there to tell me, without my having to figure it.

Q. All right. Now then do you know approximately what the atmospheric pressure is at sea level here in Miami?

A. The same as it is anywhere else.

Q. What is that?

A. Twenty-nine and a fraction inches; practically thirty inches we call it.

Q. And in pounds, how much?

A. I believe it is around seventeen pounds; I am not sure about that.

Q. In your testimony with reference to the advisability of having a smaller pipe, on account of restricting the moisture entering the tank, as you testified in your first examination, did you take into consideration the length of time that it would take the requisite volume of air to enter these tanks through a half inch pipe? Did you take that into consideration?

A. Did I take into consideration the length of time?

Q. Yes, that it would take for that air to come in there, when you said it would be better to have it go in through a small pipe?

A. Why, yes, naturally I took in consideration the length of time.

Q. All right; then did you get the length of time from your own knowledge or experiments; or did you take it from your reference books?

A. I made no experiments on the thing at all, Mr. Botts. I didn't take it from any book either. I took it my experience.

Q. Have you ever in your experience measured the amount of air that would enter or leave a tank for a one degree change in temperature?

A. I never have, and I don't think anybody else has, either.

Q. All right. Well then you said you took it from your own experience; I am trying to get at what your experience is in that connection. If you took your facts from your experience, you must have had some experience?

A. Actual contacts; knowing what occurs in nature; what occurs in actual boats.

Q. Now wait a minute, did you consult your reference book to find out how fast air would enter or leave a tank through a half inch pipe?

A. No, sir.

Q. You didn't?

A. I did not.

Q. You didn't take that into consideration at all?

A. I did not.

Q. Would you mind taking your handbook and, referring to the flow of air, and ascertain whether or not it isn't true that at 15 pounds pressure, 107—wait, I didn't understand this table.

Mr. Underwood:

Put that in the record; I didn't hear Mr. Botts' comment fairly.

Mr. Botts:

Just withdraw the question. This table that I had reference to doesn't—

Q. Don't you know as a matter of fact, Mr. Munroe, that at atmospheric pressure here, the change in the volume of air in the tank, due to atmospheric pressure, would be extremely slow, and that either a half inch pipe or a quarter inch pipe, or a two inch pipe, any one of them would be perfectly adequate to equalize the pressure in there and allow sufficient air to be expelled or taken in, dependent on whether the—depending on change of temperature in those tanks?

A. You say that it didn't matter what the size is?

Q. I say, that don't you know that even a quarter inch *tank* would have been sufficient to equalize the air pressure, the amount of air in those—in the tanks in the Seminole, considering the change in temperature caused by atmospheric conditions?

A. If you are considering the change in temperature only, I believe a quarter inch pipe would do it. I am sure I haven't made any figures on it.

Q. Well then as a matter of fact the air would go into these tanks, carrying the same amount of moisture, whether or not it was a quarter inch *tank*,—I mean a quarter inch pipe, or a two inch pipe, wouldn't it?—assuming that the outside aperture was the same in each instance?

A. Assuming that the outside aperture was the same?

Q. I mean the outside atmosphere was the same,—instead of aperture.

A. Atmosphere; the same amount of air would pass into that tank, yes.

Q. And carry the same amount of moisture?

A. A great deal of that depends on the length of your pipe. Of course if you have the same length of pipe, I still don't think the same amount of moisture would go in there.

Q. Why not?

A. Because it would have a tendency to condense before it got in.

Q. Why?

A. Because it takes longer time for it to get in, in the smaller pipe.

Q. And what would cause this condensation that you are talking about?

A. A difference in the temperature of the pipe.

Q. Now Mr. Munroe what I am trying to get at: In your experience as a boat builder,—and I am willing to concede that you are a good boat builder.

A. I am also a designer.

Q. All right, a good designer too; we will add that. I am willing to concede that you are a good boat builder and a good designer of the class of boats you handle. But have never in all your life made any experiments, have

you, to determine whether or not more or less moisture would—or the same quantity, would go in through a small pipe or a large pipe, into tanks such as this, have you? Now have you ever made any such experiments?

A. I have never made any, and I don't believe anybody else has ever made any.

Q. But you stated in your testimony that that would be a fact?

A. From practical experience I know that it does occur.

Q. I want you to tell me, if you have never made any experiment, how you know the amount of moisture that comes in, if you have never made any experiment to find it?

A. I know there is moisture in the tank, and that is the only way it could get there.

Q. But have you ever made any experiment to determine whether or not the moisture would come in more or less through a large pipe or a small pipe? You know that moisture goes in, don't you?

A. I do.

Q. And have you ever made any comparative test where one tank was with a large overflow or pressure pipe, and another one with a small one?

A. I don't know that. I have never made any test of that.

Q. Then as a matter of fact you don't know whether there would be any difference, do you? Now just frankly, do you?

A. I do know that the smaller the vent, the less trouble we have with water in our tanks; I do know that, from practical experience, and we always put in a smaller vent for that. That is one of the reasons we put it in; that is not the entire reason, not the sole reason.

Q. But you have never made any test to see whether or not that is a fact; you have simply assumed that the smaller pipe was better, is that it?

A. I don't believe anyone else has ever made any test. I have never made one, and I don't believe anyone else has ever made one.

Q. Then your testimony in that respect was without any foundation of testing; that was true, wasn't it?

A. It is without any foundation of test, yes. Practical experience means more than a test, sometimes.

Q. Well as I understand it, you have never compared the two, so just exactly where would your practical experience in that respect come in?

A. I just stated, Mr. Botts, that the tanks that had the smaller vents, we had less trouble with water in the tanks than we did with the larger vents.

Q. Give me an instance where you have made that comparison?

A. I cannot give you any definite one. That experience is spread over several years; not necessarily in boats that I have constructed, but in other people's boats, boats that I have been on, boats that I have had to repair.

Q. All right; now then let's get to another question; and that is this draw-off valve in the engine room. I understand you to say that you consider it proper practice to put a draw-off valve or cock in the engine room?

A. Under certain conditions, yes.

Q. All right, under certain conditions it would be proper, and under certain conditions it would not; is that what I am to understand from your answer?

A. No, that is not the way I meant it.

Q. All right then?

A. I meant that if it was necessary to get free gasoline in the engine room, it was perfectly proper to have a draw-off valve.

Q. Then am I correct this time in understanding your answer, that you mean, that the condition of the engine room would not determine whether it was proper, but it would be purely a matter of convenience; is that what you intend to say?

A. If it is necessary to get free gasoline in the engine room, regardless of the condition of the engine room, or anything else, it is perfectly proper that it should be there. But if you don't need to get it, then there is no need to have it. I won't say that it is improper not to have it.

Q. Then again I would like to ask you: Do you mean to say that it is a matter of convenience, is the element which determines whether or not it is proper?

A. I don't know that the word, convenient, is the exact word.

Q. Well my understanding is that you say that if under the conditions as they exist, it is deemed desirable to get—to draw off gasoline in the engine room, then for purposes of convenience, that you then consider it proper; is that right?

Mr. Underwood:

If your Honor please, I object to that because the witness didn't use that word; he used the word, necessary. "Convenience" is Mr. Botts' word.

The Court:

I think the witness can protect himself in that. I will overrule the objection.

A. What is the question again, please, Mr. Botts?

Mr. Botts:

Read it.

(The last question was read by the reporter.)

A. In the case of the Seminole.

Q. Wait a minute, let's get the question generally, and then we will come down specifically. Just answer the question as asked please.

Mr. Underwood:
If your Honor, please—

The Court:
He is drawing the emphasis on the matter of convenience, Mr. Munroe. Is that the reason?
A. I wouldn't use the word, convenient. It is necessary, it is not convenient.

(By Mr. Botts):
Q. When would it be necessary? What would be the circumstances that in your judgment would render it necessary, then? I am trying to find out when you say it is proper to have it in there, and when you say it is not?
A. When it is necessary to have gasoline to prime your motors.
Q. Then if with the sort of motor you have in a vessel, in order to start that motor you have to prime the motor, if that is the sort of equipment, then I understand you to say that you consider it proper to have a draw-off valve in the engine room?
A. That's correct.
Q. Then let's get to this: Do you say that there is any added hazard from accumulation of gasoline fumes, by having a draw-off valve in the engine room?
A. No, there is no greater hazard.
Q. In other words you assert that there is no added hazard by drawing off gasoline in a closed engine room? Is that your statement?
A. That's correct. I do not believe there is any added hazard.
Q. None whatever?
A. No, sir.
Q. Do you agree that gasoline fumes in an enclosed space such as an engine room, is to any degree a hazard?

A. That all depends on the quantity of it.

Q. Well if a large quantity would be a hazard, a small quantity would be a lesser hazard, wouldn't it?

A. Yes.

Q. Then if there is a substantial quantity of gasoline fumes in an enclosed space, that is a hazard, isn't it?

A. Yes, it would be.

Q. Now then do you agree that—strike that. Is it possible in your judgment, from your experience, to draw off gasoline from an open draw-off valve without some gasoline fumes being thereby left, if it is done in an enclosed space, some gasoline fumes being left in the enclosure?

A. There is a certain amount of fumes come from drawing off gasoline, yes.

Q. All right. Now then Mr. Munroe, if some gasoline fumes is a hazard, the extent of the hazard depending on the extent of the fumes, then isn't it true that any procedure which will allow any quantity, even a small quantity of gasoline fumes to be left in an enclosed place, would to that extent be an added element of hazard?

A. That all depends on the amount of ventilation you have there while you are drawing it off. If the engine room were entirely closed tight, it would be an entirely different situation.

Q. Then as I understand it, in effect, what you say is this: That if gasoline fumes are emitted in an enclosure, and then by ventilation taken out of the enclosure, when the fumes are removed the hazard would be removed, wouldn't it?

A. Yes, sir.

Q. And if the fumes stay there a hazard would stay there, wouldn't it?

A. For a certain length of time.

Q. Well as long as the fumes stayed there a hazard would be there, wouldn't it?

A. Those fumes would be diluted in time.

Q. Wait just a minute now, would you mind answering the question? As long as the fumes stay there, the hazard would be there, wouldn't it?

A. Yes, but your fumes could be diluted,—would be diluted.

Q. The extent of the fumes would measure the extent of the hazard, wouldn't it?

A. Yes.

Q. And if they were very diluted fumes the hazard would be less, wouldn't it?

A. Yes.

Q. But so long as the fumes stayed there, the hazard, to that extent, would be there, wouldn't it?

A. Yes, as long as the fumes were there.

Q. You agree that gasoline fumes are heavier than air?

A. They are.

Q. You don't know as a matter of fact that when gasoline fumes get into an enclosed place,—such for instance as the bilge of a boat, that until air circulates through there, that the gasoline fumes may stay there for a very long period of time. Isn't that true?

Mr. Underwood:

May I have that question read, please?

(The question was read by the reporter.)

A. That entirely depends on the volume of the bilge, or the space in which the fumes are contained, and the amount of the fumes.

Mr. Underwood:

What was the last, Mr. Bryant?

(The last question was read by the reporter.)

Mr. Botts:
Now would you mind reading the question,—

Q. Because you haven't answered it at all, Mr. Munroe.

Mr. Underwood:
If your Honor please, I submit that that is an answer to that question.

Mr. Botts:
Well, I am asking it again, then.

Mr. Underwood:
I object to the repetition of the same question.

The Court:
Let's hear the question and the answer.

(The last question and answer were read.)

Mr. Botts:
The question I asked, if the Court please, involves a question as to whether or not gasoline fumes are dissipated of their own motion, or whether they don't have to be removed; the length of time that they will persist.

The Court:
I think you have given your explanation of your answer, but I think you ought to answer it more in the nature of yes or no, and then give your explanation.

Mr. Underwood:
If your Honor please, I submit that the witness has in effect said that he can't answer it yes or no; he said "it depends on".

The Court:

All right, if he says he can't, then that would be his answer.

Mr. Underwood:

That is implicit in his answer already.

The Court:

I construe your answer as explanation. Now if you can answer the question yes or no, it calls for a yes or no answer. If you can't answer it yes or no, why then you can state why you can't answer it that way; then let your explanation be supplemental to that.

A. I don't believe I can answer yes or no to that question without having some definite knowledge of the question.

The Court:

All right.

(By Mr. Botts):

Q. Let's then get down to kindergarten questions. If gasoline fumes,—gasoline vapor, is put into an enclosure such as a completely enclosed tank where there is no aperture to the air, they would stay there indefinitely without becoming dissipated, isn't that true?

A. They would remain in that,—they would remain there.

Q. All right. In other words, gasoline vapors don't neutralize themselves and become dissipated by any self-enervating action, do they?

A. The fumes that were put in there, that depends on the size of the container; the fumes were put in it, depends on the quantity of the fumes, the amount of air that is in there. If you put a small quantity of fumes in

there, with a large quantity of air, the fumes will be dissipated; the percentage will be distributed over the entire volume of that tank.

Q. Mr. Munroe, if you will try and comprehend the question that I asked you, these explanations that bring in something entirely foreign to the question, won't be necessary. The question is this; suppose we would take a perfectly airtight tank and insert into that tank, gasoline fumes, and close it up in there, those gasoline fumes would not be dissipated by their own action, would they?

Mr. Underwood:

I object to that on the ground that the question is not complete. It doesn't say whether the tank is filled with gasoline fumes; and if not, what percentage of the content of the tank is air and what percentage is fumes. If Mr. Botts wants to assume the tank full of gasoline vapor and nothing else, that is one thing.

Mr. Botts:

I can't assume that counsel is as dumb as he acts, either. He is simply trying to distract attention from the question that I am asking; and the question is perfectly complete if he wants to listen to it and wants to answer it; and I am going to sit here, if we stay for two weeks, until I get an answer to these questions.

Mr. Underwood:

If your Honor please, I must object to Mr. Botts' comments that are personal to me, and ask you to admonish him not to continue along that line. He has spoken of kindergarten, and counsel not being as dumb as he acts, and so on. I think that is no proper part of the record in this case. If Mr. Botts is going to be permitted to indulge in those remarks, I think that I may perhaps be unable to restrain myself at various times, when

provoked by Mr. Botts. I would prefer not to have it there.

The Court:
I didn't understand that the remark about kindergarten referred to counsel. I do think, along that line, that it would be best to let the questions be devoid of comments on what the answer has been; just let it be a question, and without comments; I think that would be a good idea.

Mr. Botts:
I would like to have the last question answered, and you will see that it is a complete question.

Mr. Underwood:
May we also have the question and answer immediately preceding it?

The Court:
Before we have any re-reading, I want to think it over a minute.

Mr. Botts:
If the Court please—

The Court:
Let me think it out, Mr. Botts; I understand your position.—Now read the question, Mr. Bryant.

(The last question was read by the reporter.)

The Court:
Well here is my reaction to that: Of course you are dealing altogether with theory. You are assuming in the question that the gasoline fumes are emitted into an air-

tight compartment; and I take it from the question, it refers to a theoretical case or something dissimilar from an engine room.

Mr. Botts:
That is right.

The Court:
But the theoretical airtight compartment—

Mr. Botts:
Yes, sir.

The Court:
Now then as to whether that compartment is entirely devoid of solid matter or liquid matter,—as I understand the objection, there is not injected into the theoretical question, as to what the condition of the airtight compartment is. It may be airtight so far as contact with the air is concerned, but its physical contents are not inclined in the question.

Mr. Botts:
It contains nothing but gasoline fumes.

Mr. Underwood:
Then I have no objection to it.

The Court:
My understanding of the objection was on the ground that you didn't incorporate in the questions, the hypothesis or the basis as to what was in the airtight compartment.

Mr. Botts:
Well I thought when I said, take an airtight compartment and put gasoline in it, if I didn't say I didn't put anything else in it—

The Court:

Well the objection is that it does not embrace the condition as to what was in the airtight compartment. It is airtight so far as air is concerned, but as to whether there is some liquid or solid matter in there, is not included in this question.

Mr. Botts:

It seems to me that it is perfectly plain that if you take a vacant space and say you put air in it, are you not assuming—it is not necessary to say you are not putting nails in it or coal in it, or manganese in it, or anything like that. That you are putting gasoline in it.

The Court:

But what is in there already? If it is absolutely devoid of any—

Mr. Botts:

Nothing.

The Court:

—substance, and just free of matter, why then I think that the question is clear. But technically I sustain the objection, and as I understand it—well anyway, I sustain that technical objection.

Mr. Underwood:

If Mr. Botts, your Honor, wants to assume that the tank is completely filled with gasoline vapor, that there is no air in it, I won't object to the question.

Mr. Botts:

All right, let's proceed.

Mr. Botts:

The point is this now; that I want to make myself clear right now. He has put a man up here as an expert.

Now then I am testing,—and I am not arguing his expertness along certain lines, but I am testing whether or not he is in fact an expert witness on the question of gasoline and so forth, or whether he is just a common, ordinary witness in that respect. Every time I have asked him a question the witness has dodged, and if he hasn't dodged, counsel has gotten up and by making an objection has suggested a method by which he can dodge the categorical answer to that question. Now I would like to have the witness give me credit for trying to ask questions that are not trick questions. If he does not understand the question, let him say so and I will try and make it plain. But I don't think that it is proper,—and that's the reason that I have made the remark I have, —I don't think it is proper for counsel as it seems to me, to try to divert the course of an examination when a witness is on cross examination and is put up as an expert, and is therefore an intelligent witness,—for counsel to all the time interject by objections when the witness is perfectly capable of protecting himself. I would like to have a little chance to develop a line of testimony from this witness; and you certainly can't do it if you are continually being captiously interrupted.

The Court:

Well all I can do, gentlemen, is to deal with situations as they are presented. I had an objection to rule on, and I have ruled.

(By Mr. Botts):

Q. Mr. Munroe, suppose you take a perfectly empty airtight receptacle and put gasoline fumes in there; would those gasoline fumes ever dissipate themselves, or would they remain there indefinitely.

Mr. Underwood:

If your Honor please, I make the same objection.

The Court:
I overrule that objection.

Mr. Underwood:
That is the same question.

Mr. Botts:
Judge—

The Court:
Let's go on now; I have ruled.

A. Mr. Botts I cannot answer that question in the form it is put, because you have not told me what quantity of fumes there are in the can, or in the container; you have not stated that it is completely filled with fumes, to saturate the solution.

Q. If there is nothing but gasoline fumes in there,—if there are gasoline fumes and nothing else in that container, will they dissipate themselves, irrespective of the quantity?

A. But you didn't ask me that before, Mr. Botts.

Q. Exactly what I did. Can you answer the question?

A. Under conditions that there is nothing in that can or container but gasoline fumes, that is to the saturated solution, then I will say that they cannot be dissipated.

Q. Don't you know that there is no such term as a saturate solution of a vapor?

A. There is.

Q. All right. Would it make any difference whether there was a cubic centimeter of gasoline fumes in a tank, or a cubic foot, provided there was nothing else in that container,—as to whether or not they would be self dissipating?

A. If the tank contained a cubic centimeter or a cubic foot if that is the capacity of the tank, then there would be no dissipation, no.

Q. But suppose you take a perfectly vacant tank, no air, it is a vacuum, and you put a very small quantity of gasoline vapor in there, will it ever be self-dissipated?

A. That's a different question. No, it would not.

Q. Then gasoline vapor will not—if it is once placed in any receptacle, will stay there until it is removed by some means; is that right?

A. Fumes will stay in that thing until it is removed, yes.

Q. Then if you take a small amount of gasoline fumes and put it into an enclosed space such as the bilge of a vessel, unless by ventilation or otherwise that gasoline fumes is removed therefrom, it would stay indefinitely, wouldn't it?

A. It would if everything was tight, yes; if it was just as airtight as a tank would be.

Q. I am not talking about airtight, now; I say, since that isn't self-dissipated, if it is put in a place it will stay until it is removed by ventilation or some other means, wouldn't it?

A. Yes.

Q. All right; since gasoline is heavier than air, it would be true that it would be likely to collect and remain to some extent in the lower portions of a vessel such as its bilge, wouldn't it?

A. It would accumulate in that portion of the vessel in the bilge, yes.

Q. And it would tend to remain there or be dissipated, depending upon how adequate or inadequate the ventilation might be, wouldn't it?

A. Not necessarily the ventilation, no.

Q. Well, circulation?

A. Nor circulation.

A. If there were no circulation, it would be dissipated.

Q. How?

A. By the gradual dilution of the gas into the air that is in that space.

Q. Well if it became mixed with the air, it would still stay there, since it is not self-dissipating; it would still stay there until it was removed by ventilation, wouldn't it? It might become diluted, depending on the quantity of air with which it was mixed?

A. Yes.

Q. But it would still stay there unless it was removed by ventilation, wouldn't it? It might become less powerful a mixture?

A. To entirely eliminate it, it would take some ventilation.

Q. All right, and the quantity of air with which it was mixed, in relation to the quantity of gasoline fumes, would determine the relative mixture of the final air-gasoline fumes mixture, wouldn't it?

A. It would.

Q. In the gas in the engine room of a vessel such as the Seminole, or any other motor vessel, where it has a bilge more or less adequately ventilated, if gasoline fumes were emitted in that engine room, there would be a tendency for those gasoline fumes to fall or drop down to the lower level of the bilge, wouldn't there?

A. Naturally.

Q. And stay there?

A. Not necessarily stay there.

Q. Subject to being removed by ventilation?

A. That's correct.

Q. Then that being true, if a space was inadequately ventilated, a small quantity of gasoline vapor might be emitted daily, and fall into the bottom eventually if inadequately ventilated, creating an accumulation of gasoline vapors that might be dangerous, mightn't it?

A. There is a possibility of such a thing, yes, depending entirely on the size of the drop and the capacity of the bilge, and a lot of other x's.

Q That would depend then upon the ventilation and the relative size of the containers or room, in relation to the amount of gasoline vapors, wouldn't it?

A. Yes.

Q. And if the gasoline vapors stayed there without being removed by ventilation, even a small quantity of gasoline would eventually become a dangerous mixture, wouldn't it?

A. It could be, yes.

(A brief informal recess was had.)

Q. Do you know what the explosive mixture of gasoline and air is?

A. I believe it is about one-half to six and a half per cent.

Q. If you want to refresh your memory, if you will look at your book, at page 591 you will find it there; if you are not familiar with it from your memory?

A. I believe my memory is correct in saying, one-half to six and a half.

Q. Then a mixture as low as one and a half parts of gasoline vapor in 100 parts, that is 98½ parts of air would be explosive, is that it?

A. It could be explosive, yes.

Q. I mean, the explosive mixture runs from one-half parts out of a hundred, up to six parts out of one hundred?

A. That is correct.

Q. Then if gasoline vapor should accumulate over a period of time in a bilge or other place until it got to one and a half per cent mixture, it would then become a dangerous explosive mixture, wouldn't it?

A. It would become explosive, yes.

Q. Then let's get back now, to that question of the draw-off valve in the engine room. Isn't it true that it

is impossible to draw off gasoline without some amount of gasoline vapor being lost into the room or space where the draw-off process is occurring?

A. There is a small amount of fumes dissipated into the air, in drawing off.

Q. Then Mr. Munroe wouldn't it be true that a draw-off valve in the engine room would have a tendency to some extent of permitting gasoline vapor to accumulate or be discharged into and possibly accumulate in the engine room?

A. Yes, it is possible.

Q. All right; the care with which that process was carried out would minimize that danger, wouldn't it?

A. Yes.

Q. And that's what you had in mind, I take it, when you said that the danger of a draw-off valve in an engine room was in respect to the manner in which it was operated; is that what you had in mind? That one person could do it more carefully than another?

A. I stated the personal element is one of the factors, yes.

Q. And if a person exercised extreme caution, they could minimize the amount of danger attendant on that process?

A. Yes.

Q. But even in the hands of a person that is most careful, there would be some gasoline vapor discharged, and therefore some element added hazard, wouldn't there?

A. There would be some added hazard. Of course there other dependencies on that; the size of the engine room.

Q. Certainly. The extent of that added hazard would depend on these other elements too but there would be in some degree an added hazard; that is true, isn't it?

A. I think you could say it would be an added hazard, yes.

Q. Then that being true, isn't it true that a draw-off valve in an engine room, creates an added element of hazard in the engine room? The extent of that added element I am not discussing, but it does increase that hazard to some extent, doesn't it?

A. By that deduction, yes, I would say it does.

Q. If your previous answer is correct, there would be some added element of hazard, wouldn't there?

A. Yes.

Q. Then isn't it true that to that extent, whatever the extent of that added hazard, that a draw-off valve is to that extent undesirable?

A. It all depends on the extent of the hazard.

Q. Well, to whatever extent the added hazard is created, to that extent it would be undesirable, wouldn't it?

A. Yes, you could say that.

Q. Then as a matter of fact, the idea of placing a draw-off valve in an engine room is a question of convenience, isn't it?

A. Not convenience entirely.

Q. Well, all right. Isn't it true that in determining whether or not you put a draw-off valve in an engine room, you balance the convenience thereby served, as against the added element of hazard?

A. The added element of hazard, in what respect?

Q. That you have just said exists. You have said there is an added element of hazard; now you would balance the convenience against the added element of hazard, wouldn't you,—and determine whether or not it was worth whlie to add that added risk?

A. Well as I stated in previous testimony, that there are other hazards besides that of gasoline.

Q. Well we are talking about the hazard of gasoline, now?

A. —is the reason for having the draw-off in the engine room.

Q. All right, what are those other added hazards that you say, that would be sufficiently great to overbalance the added hazard which you concede is created by putting that draw-off valve? What are those other hazards that you thereby eliminate?

A. Well if you had no gasoline to prime your motors with, readily obtainable, in the engine room, and you had to go on deck to get it, then when a vessel—a motor should fail, either on a lee shore, or approaching a bridge or a dock, or many other things, you have the other element of danger,—hazard.

Q. But if you filled a squirt can on the deck or somewhere else, and had that in your engine room, that is all you would need for your priming, isn't it?

A. For one priming, yes.

Q. Well you can always fill it up after you have primed it, can't you?

A. Yes.

Q. All right; I get what you are driving at, all right. Now then in view of what you have said, is this in your judgment a proper deduction; that the amount of hazard created by a draw-off valve in the engine room, would depend on the amount of gasoline vapor that was thereby discharged into the engine room,—wouldn't it?

A. Naturally, yes.

Q. So that after all, in determining the element of hazard of a draw-off valve in the engine room, we would all get down to the quantity of gasoline vapor that was thereby discharged into the engine room, wouldn't we?

A. Yes.

Q. And then we would take into consideration the size of the engine room, and finally find out whether or not this discharge of gasoline vapor was likely to create an explosive mixture, wouldn't we?

A. Yes.

Q. And that would be the element of hazard?

A. That would be one of the elements regarding the gasoline, yes.

Q. Yes, that is what we are talking about, the element of hazard regarding gasoline. And if the use of that draw-off valve was such that thereby there would be discharged into the engine room a sufficient quantity of gasoline vapor to create an explosive mixture, it would then become a dangerous hazard, wouldn't it?

A. It would if it was discharging enough gasoline, yes.

Q. Yes, that was included in the question. Now then we have this can, exhibit 13,—that I believe is a five gallon can, isn't it?

A. Yes, it is a five gallon can.

Q. Mr. Munroe, if you would take an open nozzle and fill this can, exhibit 13, with gasoline, and then pour the gasoline out of the can, there would be left in the can practically five gallons of gasoline vapor, wouldn't there?

A. Yes, I would say it would be, about.

Q. And since the gasoline vapor is heavier than air, that would remain almost pure gasoline vapor in that can; wouldn't it?

A. It would for a while, yes.

Q. Yes; I mean until the circulation of air would dissipate it?

A. Yes.

Q. Then if you would fill that can with gasoline, and empty it, and then fill it again with gasoline, you would then discharge five gallons of practically pure gasoline vapor into the room where that draw-off process was occurring, wouldn't you? Because the gasoline going into the can to fill it, would force that five gallons of pure gasoline vapor out into the room, wouldn't it?

A. I suppose you could say you would, yes. I think it would.

Q. It is just bound to be a fact, isn't it?

A. It is logical.

Q. Then in addition to that there is, allowing the stream of gasoline to flow into a can, there is a certain amount of gasoline vapor that is caused by the force of the stream of gasoline striking the bottom and sides of the can, and the mixture in there, so there would be some additional gasoline fumes created that way, wouldn't there?

A. There would be possibly a small addition, due to the extra surface.

Q. Then we can assume that that added gasoline vapor in there would probably equal the impurity in the can, so every time we would have the can filled we would get about five gallons of gasoline vapor that would be dissipated, wouldn't we?

A. Yes.

Q. Now then would you mind taking your pencil and telling me what the cubic contents of the bilge of the Seminole was, up to a point eighteen inches above the floor of the engine room? Could you do that?

A. If I knew the dimensions of the bilge. I don't know the dimensions of the bilge.

Q. Well you have looked at the boat. We are not trying to get to the exact cubic inch, but couldn't you, from the dimensions that we have of that vessel, give me an approximation of the cubic contents of the bilge of that vessel up to that point?

A. Yes, I could give it to you.

Q. All right, have you a piece of paper?

The Court:

Here is a tablet.

A. As I recall, that engine room is twenty feet long.

Q. No, let's have the whole bilge of the whole ship?

A. The bilge of the whole ship?
Q. Umh hmh?

Mr. Underwood:

If your Honor please, I think we ought to agree upon the curves involved, too. The curve—the radius of the bilge, the sheer forward and the sheer aft.

Mr. Botts:

This witness is a designer, and I am willing to concede in connection with the designing of boats, that he is a competent man; with reference to some of the other things I am not so liberal. But he can take this vessel, we have got the blueprints of it, and the depth of the bilge, and so on, and he has looked at it, and he can come fairly close to giving us that cubic content.

The Court:

You want him to take all of that into consideration?

Mr. Botts:

I want him to take this vessel as is, what he knows about it,—the length, and so forth; the curve of the sides, which he has examined, and tell me as near as he can,—there must be a sort of a rule of thumb method of computing the cubic contents.

Q. Wouldn't it be approximately two thousand cubic feet?

The Court:

Well let him do his figuring first.—Go on and do your figuring and then answer it.

A. I can arrive at a very rough figure.
Q. All right, that's all we are trying to get at, is the approximation; if you will come within twenty-five per

cent of correct, it will be all right. You know the length of the vessel, do you?

A. I believe it is 120 feet.

Q. 104 I believe is the figure?

A. 120 feet on deck.

Mr. Underwood:

There we are, right off the bat.

A. I will say, 110 on the water line.

Mr. Underwood:

What is your length eighteen inches above the keel?

(By Mr. Botts):

Q. It doesn't matter; you have examined her, go ahead, take any figures that you want.

A. But I haven't taken any measurements on the top of the hull forward, or the top of the hull aft, Mr. Botts.

Q. I understand that, and therefore I understand that this is going to be an approximation; but at the same time, you have examined this vessel, and you can come reasonably close to that figure, can't you?

The Court:

He has examined the vessel, Mr. Botts, but he doesn't seem to have in mind the figures on which he has got to arrive at a conclusion. What figures do you want?

Mr. Botts:

Well, we have the blueprints of the boat, they are in evidence; let him have those.

The Court:

All right, give him that.

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Mr. Underwood:

The blueprints don't give the details that you want. He can have the blueprints, as far as that is concerned.

A. I can give a rough cube of the thing.

(By Mr. Botts):

Q. Well go ahead.

Mr. Underwood:

I have no objection to that, so long as all his figures go in and we can compare them against the actual figures so far as we know them.

Mr. Botts:

Certainly, if you can furnish the actual figures—

A. I will assume that the length of the thing is 110 feet.

Q. All right, go ahead.

(A.) Q. I believe the beam is 21.

Q. All right. When you get down to a point two feet or eighteen inches above the engine room floor, what would be—there would be some decrease due to the curve of the bottom, wouldn't there? Take all those things in consideration. Here is that blueprint.

A. That gives me no idea of the shape of the bottom, Mr. Botts.

Q. I know.

Mr. Underwood:

Referring to exhibit A.

Q. You have examined the bottom and know generally?

A. I don't recall what the depth is from floor to the bottom of the plating, now. Can you asssist me in that?

The Court:

If the witness does not know them, he will have to be given them.

Q. Assume at a point three feet above the bottom of the vessel, then?

A. We will assume that that is three feet.

Q. A depth of three feet.

Mr. Underwood:

Amidships?

Q. Yes, all right; and assume a beam of 16 at that point.

A. She carried her beam right to the water line.

Mr. Underwood:

Is that 16 foot beam assumption referring to a 16 foot beam amidships, or an average beam of 16 feet?

Mr. Botts:

Amidships, at a point three feet above the keel; that the beam amidships was 16 feet—I mean the width amidships was 16 feet.

A. Well the beam amidships was 21 feet, Mr. Botts. I would rather use the figure 21, if you don't mind, because I do know that she carried her beam right down to the water line.

Q. But wasn't the engine room below the water line,—the engine room floor considerably below the water line?

A. Yes, but a point three feet below, say a depth of three feet, that is practically your draft.

Q. All right. I think the testimony was it was a four foot draft. All right, take it 20 feet.

A. I will take it 20 feet.

Q. All right.

The Court:

Now you are building up a lot of record with this back and forth; I think the witness ought to go on and do his figuring and then answer the question.

Mr. Botts:

All right.

A. I would say roughly 2200 cubic feet.

Q. All right.

Mr. Underwood:

May he give at this point his estimate as to beam and length and so on?

The Court:

Just for information, provided we don't get into an extended discussion on this.

Mr. Underwood:

I don't want to discuss it.

The Court:

Suppose you give the elements on which you arrive at that answer?

A. I have assumed a length of 110 feet, a beam of 20 feet, and a depth of 3, which gives me a cube of 6600; and roughly the--no, I beg your pardon, deduct a third, it would give me 4400 as the result. We deduct a third for the end beam taken off, roughly; that is the figure I use for rough displacement.

Q. Then what would be the cubic content?

A. 4400 feet. That can vary a great deal, depending on whether she has a fine entrance forward, and fine lines aft, or whether she comes up. There is a great deal depends on that.

Q. Would you mind telling me how you arrived at that figure, 4490?—Now then—

The Court:
Do you withdraw that question?

Mr. Botts:
Yes.

(By Mr. Botts):
Q. Five gallons is what percentage of a cubic foot?
A. There is 7 and 48/100 gallons to the cubic foot; it would be approximately—
Q. Two thirds?
A. Two thirds; 66%.
Q. Tell me—assuming that there are two thirds of a cubic foot of gasoline vapor discharged into the bilge of that vessel every time a five gallon can was filled, tell me how many cans of gasoline would have to be drawn off in that engine room until the entire bilge of that vessel, up to a point three feet below the keel—above the kell, would contain an explosive mixture of 1.5; assuming that none of it is dissipated by ventilation?
A. I figure roughly about 41 times; 50 times; 41 times.
Q. Then by the time 250 gallons of gasoline had been drawn off in that way, if none of those fumes was dissipated, the entire bilge of that vessel up to three feet above the keel would be an explosive mixture of gasoline, wouldn't it?
A. It would have to be, yes; you would have to draw off that much at least.
Q. Now then assuming that this draw-off valve in the engine room was not used merely to draw off a squirt can full of gasoline to prime the engines, but was used habitually to draw off in five gallon lots, gasoline, and transfer it to other boats, what do you say now

about whether or not in your opinion it was a proper thing to have that draw-off valve in the engine room, used in that way? Was it in your judgment, proper?

A. I still contend it was proper.

Q. You do?

A. Yes, sir; there is too many other dependencies on it.

Q. From the examination that you have made of the Seminole at various times, have you been able to form an opinion as to what it was that caused the explosion and fire on the Seminole?

A. No, sir. I wish I did know.

Q. Well do you concede that it was an explosion of gasoline vapor?

Mr. Underwood:

I object to the witness being asked to concede anything, if your Honor please.

The Court:

I think that is well taken. He is not in position to bind anybody by his conclusion.

Mr. Botts:

I will withdraw the question.

Q. In your opinion, was that explosion caused by gasoline?

Mr. Underwood:

I object to that. He said he hasn't been able to form an opinion.

Mr. Botts:

He is on cross-examination; I am trying to find out just what opinion he has.

The Court:

It may be repetition; I will overrule the objection. Repetition will less burden the record than to have extended arguments.

A. I can't say that I assume that it was gasoline that caused an explosion. I won't say it could have—or I should say, did. Gasoline could possibly cause the explosion.

Q. Well do you know of any other substance which could have possibly caused that explosion?

A. Yes, there are other substances.

Q. All right, what?

A. Sewer gas.

Q. Wasn't any sewer available in the bilge of the Seminole, was there?

A. I don't know. There is another gas given off by the decomposing of seaweeds; giving off marsh gas, better known as marsh gas.

Q. What is known as marsh gas?

A. I believe it is a hydro-sulphide.

Q. Marsh gas is methane, isn't it?

A. I am not sure.

Q. Are you—do you mean to suggest that there might have been methane or marsh gas present in there, that caused that explosion?

A. I am not assuming anything, Mr. Botts.

Q. I say, are you suggesting that?

A. I am not suggesting it; no, sir.

Q. Well I want you to tell me,—you are here as an expert, I want you to tell me in your expert opinion, what other possible substances than gasoline might have caused that explosion?

A. Mr. Botts, I am here as an expert on the construction of a vessel, not on gases, or explosive gases.

Q. Well you have expressed an opinion with reference to explosions. I just want to know now if there is any-

thing else that in your opinion might have caused an explosion in a boat, with which you are familiar,—generally, I mean, your being familiar with boats generally; and you suggested that there is such a gas as sewer gas or marsh gas?

A. Yes.

Q. Do you mean to suggest that that gas might have been present in the boat and caused the explosion?

A. There is a possibility of it going in there.

Q. How could it have gone in there?

A. Through open windows.

Q. And how could it have gotten down in the bilge of the vessel?

A. By settling.

Q. And for it to settle there, it would have to be heavier than air, wouldn't it?

A. Yes, it would have to be heavier than air, to settle there, naturally.

Q. You brought in marsh gas or methane; don't you; don't you know as a matter of fact—do you know as a matter of fact what the specific gravity—or the weight of methane is, relative to air?

A. I know that both of them are slightly heavier than air—I mean, lighter than air, but I don't know just what the specific gravity of either one of the gases are.

Q. Either one of which gases?

A. The ones you just mentioned; marsh gas or sewer gas.

Q. Well the marsh gas, methane, and the sewer gas, are all one and the same, aren't they?

A. I don't believe sewer gas is the same as marsh gas.

Q. Marsh gas and methane are the same, aren't they?

A. I don't know.

Q. You don't know. Well then you don't mean to suggest as a scientific possibility, that methane or marsh gas could have caused this explosion, do you?

A. I am not assuming anything, Mr. Botts. You asked me the question and I had tc answer it somehow or other.

Q. You could say you don't know, if you don't. You brought in sewer gas; now what is sewer gas?

A. I do not know the formula of sewer gas. I do know that sewer gas is explosive; I know that.

Q. Then it was just a pure guess without anything,—you didn't intend to propound that as a scientific probability or anything of that kind?

A. No, I did not.

Q. Well then are you able now, from your experience in boats, to suggest any possible explosive mixture other than gasoline, that could have been present in this boat and caused this explosion?

A. No, I don't believe I can.

Q. All right; then if it was a gasoline mixture that caused the explosion, can you suggest any other sources from which that gasoline vapor may have been emitted, and thus been present, other than the draw-off valve that we have mentioned.

Mr. Underwood:

If your Honor please, I object to that as purely speculative.

Mr. Botts:

He is an expert boatman; I am asking him.

Mr. Underwood:

Well it is speculative. It could have come from one of a thousand sources; could have been deliberately placed there.

The Court:

Let's see if I catch the question; read the question.

(The question was read by the reporter.)

The Court:

I think that is all right. I will overrule the objection. —Do you want the question re-read?

A. If you please.

The Court:

He starts out with the assumption, if it was from the gasoline vapor, could it have arisen from any other source than the draw-off valve.

(The question was again read by the reporter.)

A. Well there is any of a dozen places or more. Might have had a leak in the line; might have been a faulty valve somewheres. Might have been a leak in the tank. Might have been a thousand places.

(By Mr. Botts):

Q. All those things. All right. Now then—

A. Someone might have opened a valve and left it open.

Q. Well if that draw-off valve was opened and left open, either deliberately or inadvertently, that would still be from the draw-off valve, wouldn't it?

A. Yes.

Q. And still be a hazard, however it was opened?

A. You could have called leaving a shut-off valve to the tank, or the fuel line, a hazard, too, under the same conditions.

Q. In your testimony, you testified that these tanks,—assuming that all of them were mounted in the same way, with the one that you removed,—were mounted on wooden pads, I believe you used the word, pad?

A. Pad?

Q. Or, cushion?

A. Yes.

Q. And my notes indicate that—and to the best of my recollection, you said that you considered wood the best substance for a pad of that kind?

A. I did.

Q. Any why?

A. Because the wood is softer than metal, and prevents ——it make a softer cushion for the tanks to sit on, less chance of chafe, and the wearing of a hole into the tank.

Q. But isn't it true that if there was a slow leak in the tank, down into the pan where this wooden pad was sitting, that the wood itself would, absorb the gasoline and be in the nature of a sponge, retaining the gasoline and giving off the fumes from time to time, and yet concealing the quantity of gasoline? Wouldn't that be true?

A. The wood would absorb gasoline by capillary attraction, but being more surface from those bits of timber in there, there would be more surface for evaporation; therefore the gasoline that had leaked into the pan would evaporate that much quicker and be dissipated by the circulation of air around it.

Q. If there was a circulation; or it would descend into the bilge of the vessel if there was circulation, wouldn't it?

A. If there was not circulation.

Q. Then if the vessel was closed up tight and it gradually leaked into that pan and was absorbed in there, and then that broad surface for evaporation would cause the gasoline fumes to evaporate and go down into the bilge, wouldn't it?

A. It would only make it go down there quicker, is all. It would all go there eventually, but it would get there quicker with the wood.

Q. Now then do you consider it a proper installation of gasoline tanks such as were in the Seminole, to install those in such a manner that it is impossible to inspect them for possible leaks?

A. I don't think it is impractical.

Q. Do you consider that a proper method of installing large gasoline tanks such as were in the Seminole?—That is to install them so that they are not capable of being inspected for leaks?

A. Why yes, it is perfectly proper; it is quite common,—and proper.

Q. Wouldn't the fact—strike that. It is a fact that gasoline tanks sometimes leak, isn't it?

A. Practically most any thing is apt to leak.

Q. Then a gasoline tank designed to hold a large quantity, say, 400 or 500 gallons of gasoline, if it should leak, would become a very dangerous installation, wouldn't it?

A. If it leaked it would be dangerous, yes.

Q. And for that reason isn't it a better practice to have gasoline tanks installed so that they can be inspected for leaks? Isn't that a better practice?

A. You would have the knowledge that there was a leak in that tank, just the same, whether you could inspect it or not. The only thing inspection would do, would be to find out where it was, that's all.

Q. How would you have that knowledge, if it was a slow leak, a seeping leak, down in there? How would you acquire that knowledge?

A. By odor.

Q. And suppose it is in a rather a close tank room such as we had in the Seminole, where, when the vapor escaped it would drop down into the bilge; isn't it entirely possible it could go down there without any odor being apparent?

A. I don't think it could; it might, if no one was aboard, yes.

Q. Well I will ask you this, now; not referring to the extent of the added hazard, but to the fact of whether or not there is an added hazard; isn't it true that in in-

stalling large gasoline tanks in such a manner that they cannot be inspected, adds a certain element of hazard to the entire situation?

A. I don't think so, because you wouldn't look for a leak until you knew that there was one.

Q. You mean, if tanks were so they could be inspected, you wouldn't inspect them until you found out they were defective? Is that what you mean?

A. I say that, yes. That is human nature.

Q. Isn't it dangerous procedure?

A. No, I don't think so.

Q. You don't think so, you would rather wait, if there was danger of a gasoline leak, until the leak had developed, and perhaps fumes discharged in the bilge, before you went to look for it? You think that the better practice? You don't, do you?

A. I am not saying that is the better practice; I am saying that is the common practice.

Q. Common practice may not be good practice. Now the point I am getting at, that sort of a situation would add another element of hazard, wouldn't it? Now be frank; wouldn't it?

A. Yes.

Q. Sure it would.

A. It would be easier to leave all the gas tanks out and put said aboard her, and not leave any gasoline aboard at all; there would be no hazard in that; and leave the gasoline tanks ashore.

Q. I am trying to get the added element of hazard in this situation on the Seminole; and tanks that couldn't be inspected would then be some added element of hazard, wouldn't they?

A. I don't think so, no.

Q. Well you just said that it would. Which way do you want the question answered?

A. I still insist that the lack of inspection on the tank would not be any great hazard to the situation at all.

Q. I didn't say, great; I said, any; not great or small, but it adds some?

A. Well I say great. I admit there may be a small amount of hazard.

Q. Then it would be some small amount of hazard, we will put it that way; but not, in your judgment, a great element of hazard? That's the distinction you make?

A. That is the distinction I make.

Q. Very good. Now then let's get at this: Do you consider soldering the joints on large tanks such as were in the Seminole, a proper practice?

A. I do.

Q. You consider that proper?

A. Considering the pressure that those tanks had to undergo, soldering would be quite sufficient.

Q. Now you mean soldering on steel?

A. Soldering on galvanized iron.

Q. All right. Now then isn't it true Mr. Munroe that solder requires or is commonly applied by the use of an acid in connection with the solder?

A. That all depends on what you are soldering on; whether you are soldering on copper or soldering on—you can use—

Q. Soldering on galvanized iron?

A. You can solder on galvanized iron with a resin flux, or you can use a ready-prepared flux that has a small amount of acid in it.

Q. All right now; then isn't it true that when solder is applied to steel or galvanized iron, that there is very frequently caused by the solder, or other causes, a rusting underneath the solder, that has a tendency to cause the solder sometimes to flake?

A. Theoretically you might get such condition, if your solder was not properly applied, yes.

Q. I believe that my best recollection is that in connection with the tank that you examined, you stated that

after you examined it—strike that off "after you examined it"; that when you first examined it there were traces of solder above the point where solder now shows, on the vertical seams; and that between the time when you first examined it, and the visit that the Court made to the place, that the corrosion or some other cause had caused some of that solder to flake off. Didn't you say something of that kind?

A. I said nothing about the vertical seam.

Q. Well somewhere on that tank, that the corrosion had caused previous signs of solder to be eradicated by flaking?

A. I said that concerning the rivet heads at the bottom.

Q. I see; well I didn't recall the exact point.

A. On the outside of the bottom.

Q. Then the solder used in applying solder to these tanks, was of such a character that it did flake off by corrosive causes?

A. Accentuated by the heat of fire. Without the heat of the fire that wouldn't have occurred as readily, or possibly at all.

Q. Then isn't it true, especially on large gasoline tanks, that solder is a poor method of safeguarding the seams?

A. I would not say it was a poor method, no, sir.

Q. Well do you think it is the best method?

A. I don't say that it is absolutely the very best method.

Q. What do you consider the best method?

A. Welding is by far,—or brazing is by far the most superior method; it is absolutely tight.

Q. Other than leaving the seams entirely unreinforced, that is just with nothing but the rivets to hold them, what method of attempted safeguarding, if any, is worse than soldering, if you can think of one?

A. Most anything is worse than soldering.

Q. What?

A. I mean just not putting anything at all there, is worse than soldering.

Q. Eliminating doing nothing, is there anything,—the next worse thing is soldering, isn't it?

A. No, sir, I won't say the next worse thing is soldering.

Q. What is the next worse thing?

A. Patching up with chewing gum, trying to caulk it with a piece of twine or cotton.

Q. That isn't an ordinary recognized method is it?

A. You didn't say, recognized method.

Q. All right; you tell me what ordinarily used method other than doing nothing at all, is worse than soldering?

A. The next worse thing would be caulking it.

Q. You mean, solder is the worse?

A. No, sir, I do not say solder is the worse, I say caulking is worse than soldering. It has less chance,—beg pardon, there is more chance of leak in a caulked seam than there would be in a soldered seam.

Q. How is a seam caulked?

A. It is caulked with a fairly blunt edged tool, that has been described a thousand times here in Court.

Q. And then they just—the caulking is used by taking a tool and driving the metal into the seam?

A. No, not into the seam.

Q. Would you mind just taking a pencil and illustrating just how it is caulked? If you don't drive the metal into the seam, just exactly what does it do?

A. (Witness draws.)

The Court:

You had better put that on a fresh sheet of paper; they are liable to want that to go in evidence.

A. We will assume that your rivets are in here. In order to caulk this seam, you use a fairly blunt edged

tool at this point, not going in on the edge of the plate; on the edge of the plate, forcing this part of the metal over against this other plate, in that manner.

Mr. Underwood:
Before we go farther—

A. That is not driving the metal into the seam. If you drove one metal into the seam you would drive it down this way and expand the seam,—open it.

Mr. Underwood:
Will you indicate on there, please the seam? Draw an arrow to it—let me do it. Is that the seam, there?

A. That is the seam.

Mr. Underwood:
I will draw an arrow there and write "seam". And this next is the caulking tool.

A. That's your caulking tool.

Mr. Underwood:
That point there is the original edge of the metal?

A. That's the original edge of the metal.

Mr. Underwood:
Draw an arrow there and say, "Original edge of metal". Is this point here, the point to which the metal is forced by the caulking tool?

A. That is the point to which the metal has been forced by the tool. In other words, you sort of try to split this plate and expand it.

Mr. Underwood:

The last point I have indicated by an arrow, and at the end of it marked "Point to which metal forced by tool".

Mr. Botts:

All right.

Mr. Underwood:

Do you offer that, Mr. Botts?

Mr. Botts:

Well I am perfectly willing to let it be filed and charged to me as my exhibit. Just mark that as my next exhibit.

(Said sketch was admitted in evidence and marked Pilkington's Exhibit No. 15.)

(By Mr. Botts):

Q. My understanding is that you say you consider caulking a riveted seam,—I mean soldering a riveted seam, as superior to caulking a riveted seam, is that right?

A. I do.

Q. Now then you are familiar with the procedure in making the steel hulls of vessels, where the hulls are riveted, are you?

A. I know the construction, yes.

Q. And those, then, since it is a superior method, are of course soldered, are they?

A. They are not.

Q. How are they secured?

A. They are caulked, in the manner in which I described.

Q. And will you explain to us, if soldering is superior to caulking, why they caulk the seams of a vessel, rather than solder them?

A. Because we were talking about containers of gasoline, and not the side of a vessel.

Q. Well the tightness of the joints is more important on which type,—a vessel or a gasoline drum?

A. A gasoline container.

Q. And you think then that the solder will make a tighter joint than caulking?

A. It will.

Q. As I understand it, you have never had any experience in the making of steel hulls on vessels?

A. No I have not.

Q. And that is just your opinion, that the caulking of a joint is less effective than soldering?

A. I suppose you would call it my opinion.

Q. Now if the solder, by reason of corrosion caused by acid and atmospheric conditions, and so forth, should cause a flaking of the solder, at a soldered joint, wouldn't that add a leakage hazard to that container?

A. Yes.

Q. And that couldn't possibly occur where a joint is caulked, could it?

A. Certainly it could.

Q. It could?

A. Yes it could occur there, though there wouldn't be the effect of an acid there, that's right.

Q. It wouldn't be as likely to occur then we will put it that way, in a caulked joint, as a soldered joint.

A. A leak is just as apt to occur in a caulked joint—more so in a caulked joint than it would in a soldered joint.

Q. You have testified with reference to a drain line,—an overboard drain line from this pan underneath the tanks. The purpose, I take it, was to drain overboard any gasoline that might leak into that pan; is that correct?

A. I believe so, yes.

Q. Now then did you trace the outlet from that drain line, to see where it went overboard?

A. I couldn't find any drain line except where it came out of the pan. Apparently it had been destroyed, if it was there.

Q. Well I will ask you this; suppose that the outlet of that drain line was six or eight inches above the bottom of the pan, and two or three inches above the top edge of the sides of the pan. Then such a drain line wouldn't be at all effective in draining gasoline, if there should be a leakage, would it?

A. You say, the outlet—

Q. The overboard outlet is two or three inches above the top of the sides of the pan, and five or six inches above the bottom of the pan?

A. No, that would be impossible to make such a thing as that work.

Q. Yes; and if such was the connection, then it would be improper, or at least would give no added safety, would it?

A. Well it just wouldn't work.

Q. Just wouldn't work; all right. Now then you testified that it was customary in this area to put drain lines, or drain valves, draw-off valves, whatever you want to call them,—in engine rooms of gasoline vessels. Am I correct in that?

A. I said, of boats of the type of the Seminole.

Q. Well is there any other boat, except boats of the type of the Seminole, that it is customary to put draw-off of drain lines in engine rooms?

A. I don't know of any.

Q. Now then name some boats in the Miami area that are of the type of the Seminole?

A. Well there is a good many of them.

Q. Well name some upon which you can personally say, from your own observation, that have draw-off valves in the engine room.

A. I don't know that I can name—specify any particular boats. I don't recall the names of boats that I have seen with them.

Q. Then upon what basis did you make the assertion that such a custom existed?

A. Because I have seen it.

Q. All right, specify when and where?

A. I just told you that I don't recall the name of the boats that I saw it on.

Q. Well tell us when and where the boat was that you saw, that was of the type of the Seminole, that had a draw-off valve in the engine room?

A. I don't know that I can tell you where the boat was located. It was here in this vicinity, this locality, but just where she was at the time that I saw her, I couldn't tell you.

Q. Now you have testified to a custom. What do you mean a custom,—that it was customary? Do you mean it has been repeatedly, habitually,—that is custom, isn't it?

A. It is not done now as much as it was several years ago.

Q. It has come to be recognized as improper practice, has it?

A. No, sir, that's not the reason they discontinued it.

Q. All right, now, tell us one boat, one single boat, if you can specify, from which you draw your conclusion of the custom in that respect, that you say exists?

A. I cannot name any one specific boat.

Q. And you can't name any place where you saw it, nor any time when you saw it?

A. No I can't.

Q. That is a pretty indefinite basis to make an assertion of a custom, isn't it?

A. I do know that it exists,—or rather did exist; I won't say that it exists at the present time, but it did exist.

Q. Well, we will leave the custom there. Now then do you say that that custom, of putting draw-off valves in the engine room, exists with reference to boats of a type other than the Seminole?

A. I answered you once before, no, on that.

Q. It is only of the type of the Seminole, is the only ones that you know that is a custom?

A. Those big houseboats that were used for fishing around the Keys and Cape Sable and Shark River and that vicinity, where they have to get gasoline for their small launches.

Q. Did you ever, as a marine surveyor, make a survey of a vessel for your employer for whatever purpose, in which you found a draw-off valve in the engine room?

A. A draw-off valve such as the type that we are discussing now?

Q. Well; a draw-off valve.

A. In the Seminole?

Q. A draw-off valve,—of any type of valve; just draw-off valve?

A. I think you could find a draw-off valve in any boat right even today.

Q. That isn't the question I asked you. I said, in your surveys of boats, which you have made as a marine surveyor, have you ever found a draw-off valve in the engine room?

A. I can say I have, yes.

Q. When?

A. Now that depends on, if you are talking about drawing off large quantities of gasoline, I will say, no, such as those valves that were on the Seminole as a draw-off valve. But there are other valves where free gasoline could be gotten from the main tanks.

Q. All right, but not designed as a draw-off valve; is that what you mean?

A. Not designed primarily as a draw-off valve, but nevertheless it was a valve and it was in the line.

Q. But you have never found, in surveying a vessel, found a large draw-off valve designed for drawing off large quantities of gasoline?

A. No, sir.

Q. Well now then, what kind of of a draw-off valve have you found? What was the purpose of installation of these that you said could be used as draw-off valves?

A. In the old type motors, a draw-off valve under the bowl of the carburetor, or, in the newer boats, a draw-off valve in the bottom of sediment bulbs,—sediment traps, for the purpose of drawing off sediment and the water that has accumulated in that bowl.

Q. And that's the only thing that could be characterized as a draw-off valve, that you recall finding; is that right?

A. Yes; you could get any quantity.

Q. And that is—

Mr. Underwood:

May he finish?

A. You could draw off a large quantity of gasoline in there, through that small valve, if you took the time to do it.

Q. But those valves were designed primarily for other purposes, were they not?

A. Other purposes than what? Other purposes than drawing off gasoline?

Q. Than drawing off gasoline. They were designed to clear the pipes or clear the sediment bulbs, or sediment chamber of the carburetor, weren't they?

A. Yes, that was their purpose.

Q. And so they were not a draw-off valve. You could draw gasoline from them, but they were not draw-off valves, were they?

A. You could fill a squirt can from them, for priming.

Q. Would a valve that was inserted for the purpose of cleansing a line, drawing of sediment, would that be a —sediment and water, would that be a suitable place from which to draw off gasoline for a squirt can, to use for priming?

A. Why certainly; after you had drawn off the water, you could draw off the water, dump that overboard, and then get pure gasoline.

Q. And you have never made a survey, though, where you found a real draw-off valve?

A. Not a real draw-off valve.

Q. If you had, you would have recommended that they do something about it, wouldn't you?

A. Not necessarily.

Mr. Botts:

I am trying to get through my memoranda; I think I am practically through. I couldn't remember all these questions. I made them weeks ago, and I have to read them. There are some other questions; I can see now I have some other questions.

(Thereupon at 12:32 o'clock P. M. hearing was recessed until 1:30 o'clock P. M. of the same day.)

3556 Miami, Florida, November 14, 1939, 1:30 P. M.

Afternoon Session.

Thereupon, WIRTH MUNROE, a witness in behalf of the Respondent Phipps, resumed the stand and was examined further as follows:

Cross Examination (Cont'd).

By Mr. Botts:

Q. Mr. Munroe, with reference to these tanks that were in the Seminole how, if at all, would it be possible

to cut or remove either the bottom or the top of the tank and then reinstall it; would that be possible?

A. It would be possible to remove that end of the tank by cutting off the rivets and punching them out at the bottom.

Q. There is no evidence on these tanks that these rivets had been cut off?

A. If all new rivets were put in they would look just the same as original rivets.

Q. How would you cut them off before you punched them out?

A. You probably would have to cut them off with a cold chisel.

Q. Wouldn't cutting them off with a cold chisel necessarily leave a mark on the side of the tank?

A. Not necessarily.

Q. You think it would be possible to—

A. I think so; I think it would be possible to take them off without marring the sides of the tank.

Q. Now in your testimony with reference to these tanks you made this statement, "if there was any leak in the tanks it would certainly show up in the pan." Now if there was just a slow seepage or a very slight leak, it wouldn't show up in the pan, would it?

A. Not in the form of liquid, no.

Q. It would not show up in any form, would it?

A. I don't suppose you could call it directly in the pan, no.

Q. When you made the statement I just quoted you you referred to a very substantial leak.

A. I was referring to a substantial leak, yes.

Q. You were not referring to a slight leak or seep which might occur by reason of long usage of the tanks?

A. It wouldn't refer to seepage which would just wet the surface of the tank,

Q. In testing these tanks, Mr. Munroe, you stated that you made a hydrostatic test.

A. Yes.

Q. And, as I understand it, Mr. Munrce, you said that during the course of that test there was leakage around the bottom or outlet opening of the tank.

A. There was a leak in the bushing in the outlet of the tank due to a crack that had been put there by screwing in the fitting.

Q. Mr. Munroe, isn't it true that that leak in that bushing might have been an old crack that was reopened?

A. No, sir; that crack was put there at the time that I—not myself, but my helper—screwed the fitting in; my helper screwed it in.

Q. How is it possible for you to say at this time that that was not an old crack reopened rather than a new crack that was caused at that time?

A. Because, sir, when it occurred I distinctly heard it snap.

Q. And that would be true if it was an old crack that was reopened and extended a little?

A. No, sir; an old crack would not snap.

Q. Suppose there was an old crack all the way across that bushing and it was snapped off, there would be a snap, wouldn't it?

A. It would have snapped somewhat but not with a sound.

Q. How much more than somewhat was this snap?

A. This was a very loud report, very distinct. I examined it afterwards and could see the clean metal all the way through the top of the crack.

Q. All you could see was top of the crack, wasn't it; you didn't take the bushing out, did you?

A. No.

Q. All you could tell from the surface was that there was a crack across it?

A. Entirely a new crack across the surface.

Mr. Botts:
That is all.

Re-Direct Examination.

By Mr. Underwood:

Q. If these tanks had seeping leaks, how could that be detected?

A. By odor; by the odor of gasoline partly.

Q. In the modern boats or new boats that are built today are the tanks originally placed where they can be inspected on all sides?

Mr. Botts:
I object to that as immaterial.

The Court:
I am in doubt about that. I will reserve ruling on that. Answer the question.

A. The tanks in the modern boats are not in positions where they can be easily observed or examined. They are usually put under cockpit floor, under the wings and sometimes under tanks, with woodwork or joiner work around them.

Q. What kind of tanks are these as to material of which they are constructed?

A. A majority of them today are iron and steel and copper; I would say that a majority of them are copper.

Q. As far as access for physical inspection is concerned, does it make any difference whether they are copper, iron or steel?

A. No, it makes no difference about examining them.

Q. Have you had any experience previously with a can similar to that which was produced here this morning, which has been marked Exhibit 137?

A. Yes, I have had had experience with a can of this type.

Q. Do you own one?

A. Do I own one?

Q. Yes.

A. No, I don't own one.

Q. What has your experience been with cans of that type?

A. There have been several of these cans used by boats in my vicinity, in the vicinity of my shop, and they have very short life.

Q. What happens to them?

A. They very soon rust out.

Q. Do you know why that is?

A. Well, it is a straight steel tank that is not protected with any galvanizing or tinibg or anything.

Q. Soldered?

A. I don't believe these are soldered.

Q. Are they caulked?

A. I don't know what the construction of the tank is at all.

Q. Are they galvanized?

A. They are not galvanized; just plain steel, black steel.

Q. If you were going to provide gasoline on the Seminole for priming the motors and contemplating using cans of that type, what would you have to consider in determining how many of these you got?

A. Depending on how long you were going to be away from the supply of gasoline.

Q. How many times you might have to prime the motors?

A. Yes, how many times you might have to prime the motors.

Q. You might have to have a great many?

A. Yes, considering the fact that you use about a quart of gasoline to prime both motors each time you start.

Q. Now you were asked whether you could see any evidence that the lower crown of the gasoline tank which you saw had been at one time removed and replaced. Could you see anything that indicated that it had not been removed?

A. No.

Q. In other words, could you tell from anything you saw whether it had been or had not been?

A. I had no way of telling whether it had been removed or not.

Q. You were asked whether the heads of the rivets could be taken off by chiseling; do you know whether they could have been burned out?

A. Burning them out would have been a very poor way, considering the tanks had gasoline in them at previous times.

Q. Could they have been burned out with an acetylene torch?

A. Yes, but it would have been very poor practice to try it.

Q. Getting back to these draw-off valves, is it your opinion that the hazard, to use Mr. Botts' word, incident to drawing off gasoline with drawoff valves greater or less than the hazard of doing it otherwsie?

A. I don't believe I get quite all of your question.

Q. I will try to rephrase it: which in your opinion is the greater hazard, whatever hazard there may be in drawing off gasoline, from the draw-off valves or arranging to get the gasoline in the engine room in some other way, such as a tank on deck or a number of these cans such as Exhibit 137?

A. I consider the use of draw-off valves as being the lesser hazard.

Q. Now do I understand that you are at the present time proprietor of a repair yard?

A. Yes.

Q. When did you begin to run that repair yard?

A. About 1932 or 1933; I have forgotten the exact date.

Q. What association did you have with it before that time?

A. My father opoerated it before that, and I worked for him.

Q. What was the nature of your responsibility with your father; who operated it; who was in charge of the repairs?

A. My father really had the final say-so, but long in the latter part of his ownership of it, I really did most of the work and he merely backed me up on it, you might say.

Q. In other words, by a gradual process you took over your father's business?

A. Yes, I gradually took over his business.

Q. From that time on, Mr. Munroe, will you tell us whether the repairs done there have been made under your supervision?

A. Well, ever since I have had anything to do with it at all, ever since 1932, all the repairing that has been done has been under my supervision.

Q. Has the work done at that yard included repairs to motors or replacing motors or anything of that sort?

A. It has been replacing or repairing of motors, installation of new tanks, installation of new motors, and I might say the complete rebuilding of hulls.

Q. Is that the kind of work that has been going on at this yard under your supervision?

A. There has been work of that type, but not all of it.

Q. Has that been a steady business with you or on rare occasions?

A. No, that is a steady business; it has amounted to roughly a gross business of about twelve or fifteen thousand dollars a year.

Q. Have you ever built a boat that was not merely auxiliary but propelled entirely by "motor"?

A. Small launches, open launches, and besides the one that is under construction at the present time.

Q. Did you build a boat called the Grampus?

A. I did.

Q. What was her power?

A. She had a six-cylinder 88-horsepower Universal gasoline motor.

Q. Did she have any other source of power?

A. You mean "compulsion" power?

Q. Any kind; would she sail, in other words?

A. She would sail with auxiliary power. The engine room is also equipped with another motor, though; it has a four kilowatt generator.

Q. How long was she?

A. She was about 60-feet.

Q. What did you have to do with the construction of her?

A. I had complete supervision of the construction; I was on the job from the time her keel was laid until she was delivered to the owner; I assisted in delivering her back to Miami.

Q. Who drew the plans?

A. I drew the plans.

Q. Who decided the layout of the gasoline supply system?

A. I did.

Q. What kind of tanks—who decided that?

A. I decided the type of tank.

Q. Mr. Botts asked you something this morning about steel ships in the course of construction or otherwise. Where were these that you had in mind, those that you looked at; what was your purpose in looking at them, and under what circumstances did it occur?

A. Partly in the plant of the Electric Boat Corporation in Groton, Connecticut where they were building submarines for the United States navy, and also the construction at the Herreshof plant in Bristol, Rhode Island.

Q. What I want to get you to tell us is whether that was idle curiosity or something more; if so, what?

A. While I was at Bristol it was part of my education, because I was then an apprentice or assistant to Mr. Herreshof, Mr. Herreshof, Senior; M. G. Herreshoff, I should say, as there are so many Herreshofs now; and whenever we went through a yard he would naturally explain in detail all of the construction that was going on, explain it in detail to me; he was my instructor.

Q. In your surveying business are you from time to time ever employed by the Marine office of America?

A. I am.

Q. Do you make surveys for them for insurance purposes?

A. I do.

Q. On cross-examination by Mr. Matteson in October you said it was not good engineering practice to have a feedline run from a port trap over to an auxiliary; do you remember that?

A: Yes.

Q. From what standpoint was it not good engineering practice?

A. Because you would be feeding your auxiliary motor with the refuse that would be caught in this trap.

Q. Is there any fire or explosion hazard involved in that type of connection?

A. No, none whatever.

Q. Now when you are designing boats, Mr. Munroe, and considering what ventilation you shall provide for her in the way of windows, portholes and otherwise, I would like to know whether you make any calculations as to the amount of gasoline vapor that has to be removed by that natural ventilation?

A. No, sir.

Q. Do you assume any leakage in tanks or gasolines in order to determine how much ventilation an engineroom ought to have?

A. No, we don't determine that.

Q. What is the purpose of providing ventilation?

A. The main purpose of supplying ventilation in the engineroom or any other part of the vessel is to protect it against condensation on the inside in the case of a steel vessel, and in the case of wood to keep it aired out to prevent rotting of the timber, and in the engineroom to supply the required amount of air for the motors; motors have to have a supply of fresh air in order to run, and if it is a large engineroom there is an engineer stationed in there and it is necessary for him to have air, fresh air.

Q. Now considering the Seminole's ventilation as confined to the engineroom, the two windows on the port side, the one window on the alleyway on the starboard side, two cowl ventilators, the hatch and the skylight,—in your opinion is that adequate ventilation for all ordinary purposes?

A. That is quite sufficient.

Q. Considering that the ventilation of the tank compartment consisted of the four filler holes in the top, the four feedline holes towards the bottom of the bulkhead, the square opening below and the space around the pans,—in your opinion is that adequate ventilation for all ordinary purposes?

A. It is.

Q. In order to tell whether the natural ventilation that I have just asked you about is enough to take care of any seepage or leakage of gasoline creating vapor, what more would you have to know?

A. You wouldn't have to have "any".

Q. My question is, this, Mr. Munroe: assuming the sources of natural ventilation that I have just described

to you, the windows and the cowls and the skylight and so forth, in order to determine whether or not those openings would provide enough air to remove any gasoline vapor that might get in there, what would you have to know about the quantity of gasoline vapor and any other factors?

A. I am afraid I don't quite understand your question.

Q. Maybe I can put it more clearly in another way: if you drop a teasponful of gasoline on top of one of the motors in the engineroom, can you tell whether the natural ventilation from the sources I have mentioned would vaporize that and carry the vapor away and not permit it to get down into the bilge?

A. Well, there would be plenty ventilation to carry away any small quantity of gasoline vapors.

Q. Suppose you upset a 55-gallon drum of gasoline in the engineroom and let it all run out, could you tell me whether the natural ventilation provided from the sources that I have mentioned would carry away the vapor in any particular length of time?

A. I don't know as there is any way of actually measuring that; it could be measured, I suppose; it depends on the length that the ventilation is there.

Q. What in your opinion does that depend upon; you say time is one factor?

A. Yes; it depends on the pressure of the air entering the cowl or ventilator.

Q. In other words, how strong the wind was?

A. Yes; how much disturbance is caused in the engine room to dissipate the fumes, or dilute them.

Q. I suppose the quantity of gasoline or vapor is a factor?

A. Yes, indeed.

Q. How about lapse of time?

A. Yes, lapse of time is a factor.

Q. Bearing these things in mind, in your opinion would any dangerous accumulation of gasoline vapor occur when you draw off gasoline out of these draw-off valves into a can of the type before you on the floor there?

A. Not in my opinion; there would be plenty of ventilation there to carry off any fumes.

Q. How about filling the squirt cans for priming?

A. It would even be less in that case.

Q. There has been some talk of rust inside of these tanks in the so-called "V" at the bottom; can you tell us a little bit about rust; as I understand it, it is a process of oxidation, is that right?

A. Yes, it is.

Q. Does that mean that there is a certain affinity between steel and oxidation that results in rust?

A. In any ferrous metal oxidation is called rust; it occurs much more rapidly in the presence of air; the amount of rust that would be deposited would be determined by the quality of the steel or of the ferrous metal that was used; when it was covered by a liquid, such as water or gasoline, there would be a very, very small portion of rust appearing.

Q. Well, assuming that there was water in the "V" at the bottom of the Seminole's tank due to condensation inside of the tank, would you say that any process of oxidation down there in that "V" would be a rapid or slow process?

A. It would be a very slow process of rust in there.

Q. Why?

A. Because it is sealed by the water and the only oxidation that could take place would be the amount of oxygen obtained from that water that is there; after that had been used up, there would be no more rust.

Q. From your observation on the Seminole of the pans under her tanks, can you tell whether they would shift or not?

A. From my examination of them I would say that they have not shifted any at all.

Q. Are they solid and secure?

A. To all appearances they are solid and rigid.

Q. Did you step in them?

A. I have stepped in them; there is no indication of them having moved at all.

Q. About this hydrostatic test just one more question: is this hydrostatic test recognized as a proper test for leakage?

A. It is.

Q. I think you say, in answer to one of Mr. Matteson's questions, that you would not prefer to install a glass gauge six feet long. What have you in mind about that; what is your reason or what have you assumed about such a gauge?

A. I assumed that that was a gauge that would be unguarded, and it is perfectly possible to put in a tube that long—

Q. How about seven feet?

A. And protect it; yes, even seven feet, and protect it; it would be just as safe as the one six inches long.

Q. Mr. Munroe, I show you Libelants' Exhibit No. 6, a photograph, and ask you to tell me whether or not the holes at the top of the bulkhead between the tank compartment and the engine room, and the holes at the top of the bulkhead at the forward part of the tank compartment, indicate anything to you; if so, what?

A. Those holes indicate to me that there was a beam across there at sometime that that plate was made fast to.

Q. Would such beams across there serve any purpose in stiffening the bulkhead?

A. Yes; they would assist materially in stiffening that bulkhead.

Q. You see the same holes in Exhibit 112 at the top of the bulkhead, between the engine room and the tank compartment, do you not?

A. I do.

Q. They are in line across there?

A. I judge they are; the top is pretty well destroyed now.

Q. Do these vertical angles that appear on the engine-rom side of the bulkhead coming to the engine room tank compartment shown on Exhibit 6 serve any purpose for stiffening?

A. They add considerable to the stiffness of that bulkhead.

Q. In your opinion is that adequate stiffening for such a bulkhead?

A. It is quite sufficient.

Q. Could that bulkhead do any weaving under ordinary circumstances with these stiffeners in it?

A. I don't see how it could. I think these same frames were there when that was a coal bunker, and coal was laid immediately against that bulkhead.

Q. Mr. Munroe, you were asked by Mr. Matteson whether you would pass at the present time this connection between the valve marked Crane 150 and the union which form a part of Libelants' Exhibit number 11, the drain valves, and you said that you would not. What did you have in mind about that connection that you would not pass at this time?

A. At that time I was judging from the fact that this nipple was not the full length.

Q. Do you refer to the nipple between the union and the valve, Crane 150?

A. Yes.

Q. Is that right?

A. That is right.

Q. Can you tell at this time whether all the threads on that nipple were used up in making that fitting at the time of the fire?

A. No, I couldn't say that they were all used up at the time of the fire.

Q. Can you tell whether or not it would leak today?

A. Yes, I could tell whether it leaked today or not.

Q. How?

A. By blowing through it or sucking through it, when it is set up tight. This has been apart—

Q. I don't think the union has; I have never seen it apart, have you?

A. No.

Q. Now, will you see if you can suck through there, covering up two of these opening, and see if you can get any air through there?

A. I can't get any air through there.

Mr. Underwood:

Let the record show that in making that little test I have removed the valve marked Crane 125 from the exhibit, and also the plug, and removed the seat of the valve marked Crane 150, and that the witness blew or sucked, rather, on the end that makes contact with the valve, Crane 125, after covering up the other two openings and holding them tight with his hand.

Q. Suppose you light a cigarette and see if you can blow any smoke through it; take a mouth full of smoke and blow it at the same end, and hold the other two connections.

Mr. Underwood:

Does your Honor see that no smoke, cigarette smoke, comes through there? That is all.

Re-Cross Examination.

By Mr. Matteson:

Q. Mr. Monroe, you were saying that tanks in modern boats are sometimes installed under the cockpit floor or

wings where they can be equally examined in place. What type of boat were you talking about?

A. I am speaking of a great many of these stock boats as manufactured by Chris-Craft, Wheeler and Matthews.

Q. Cruisers and auxiliaries?

A. They are strictly power vessels.

Q. What size are they?

A. Up to fifty feet.

Q. What size would the tanks be?

A. The tanks would probably hold—the total tank capacity—not more than three to four hundred gallons.

Q. How many tanks?

A. Usually about two tanks; 150 to 200 gallons apiece; that all depends on the size of the motor that is installed in the boat.

Q. Such tanks could be disconnected and removed readily, could they not?

A. Yes, I believe they could be; those under the cockpit floor could be removed, yes; you might have to remove the motors first.

Q. Now take engines of the type in the Seminole, do I understand you to suggest that it would take a quart of gasoline to prime them?

A. That is my opinion; I believe it was testified by Schlappi—

Q. I am not asking you about the testimony of any witness; you testified that it would take or you intimated by your testimony that it would take a quart to prime the motors. Now I want to know what you base that on; are you basing that on Schlappi's testimony?

A. No, not entirely, except that he made the same remark.

Q. Are you suggesting that it would take as much as a quart of gasoline to prime the motors of the Seminole?

A. In my opinion it would take a quart to prime both motors.

Q. The purpose of priming is to get enough gasoline into the various cylinders for the initial explosion?

A. That is right.

Q. That is one revolution of the engine?

A. Yes.

Q. These engines at full speed made about 450 revolutions per minute?

A. I don't know what the r. p. m. was; somewheres in that neighborhood; not over five hundred, I don't think.

Q. Can you tell us the gasoline consumption per hour of one of these engines?

A. I don't think I can give it to you exactly; I believe it is in the vicinity of maybe twenty to twenty-give gallons an hour.

Q. You are talking about two engines?

A. I think so.

Q. You don't mean that it would take that much for each engine, do you?

A. No, for the two engines; that all depends on the speed that they are running, of course.

Q. Can you tell us how much gasoline would be consumed in one explosion of one cylinder?

A. No, I couldn't; I could tell you maybe by figuring it backwards.

A. It wouldn't be very much, would it?

A. No, it wouldn't be very much in actual raw fluid.

Q. Can you tell us how much gasoline vapor is produced by a given quantity of fluid gasoline?

A. No, I don't know that offhand.

Q. There is considerable degree of expansion in gasoline fluid by reason of gasoline vapor, and gasoline vapor gives a considerably greater amount of space than the gasoline fluid; is that a fact?

A. Yes.

Q. Still, do I understand you to suggest that it would take a quart of gasoline to prime six cylinders on two motors?

A. Yes, because you always use more raw gas in priming than you would while your motors are running; after the motor is warmed up it wouldn't require the amount of raw gas it would in starting.

Q. Of course there would be a disadvantage in putting in too much gasoline in that it would interfere with the lubrication, is that correct?

A. You would consider that, yes.

Q. What you would do in priming the motors would be to put in the minimum amount that you could to start them, would that be true?

Mr. Underwood:

I object to this; what this witness would do is immaterial; what was actually done is the question, and he doesn't know.

The Court:

It is just another way of asking him what his opinion is. I will overrule the objection.

A. I would say that the amount of gasoline would be determined by practice and use of the motors, and as you use the motors you would know more or less what the amount of gasoline is that would be needed.

Q. Of course, Mr. Munroe, it is also true that there is an upper explosion limit where you get too much gasoline in the cylinder and you get no explosion; is that true?

A. Yes, that is true.

Q. In other words, if you flood a cylinder it is difficult to start it as if you didn't have enough gasoline?

A. You would have to expel a certain amount of it before it would explode; but these were very large cylinders and had considerable capacity. I don't know what the displacement of the motor was for each cylinder.

Q. That was just about what I was going to ask you. Do you know the displacement?

A. I don't know the displacement of the motor offhand.

Q. You were asked a double-barreled question as to whether you would consider a draw-off valve in the engine room a lesser hazard than a can, such as Exhibit 137, or an auxiliary tank on deck, and I think you answered that question by saying taht you considered the draw-off valve the lesser hazard. Will you tell me specifically whether you had reference to an auxiliary tank on deck as being a greater hazard than draw-off valves in the engine room?

A. Taking into consideration the same statement that I made at a previous time, concerning the going on deck to get it, I consider that it would be a greater hazard.

Q. Well, there would be no fire hazard in having an auxiliary tank on deck as a supply, would there?

A. There could be.

Q. Well, of course I suppose there is a fire hazard wherever there is gasoline, but the handling of gasoline on deck would be of very much lesser hazard than handling of gasoline under deck, is that true?

A. I believe you could say "yes".

Q. You don't have any doubt about that, do you?

A. Well, I have seen some pretty terrible things occur out on deck.

Q. I think the vessel called the Grampus was referred to; was that a wood vessel?

A. Yes.

Q. What sort of tank did she have?

A. Tin lined copper tanks.

Q. Of what size?

A. To the best of my recollection they were about 150 gallons apiece; they were molded into the shape of the vessel.

Q. What type of vessel was the Grampus?

A. She was an auxiliary ketch.

Q. Did she have an engine room?

A. She did.

Q. Did she have a draw-off valve in her engine room?

A. No, sir, and the motor had no way of being primed either.

Q. You answered another question, and I am not sure that we got the full implication of it. You were asked about the ventilation of the tank compartment, the four filler holes at the top and so forth, and you were asked if that would be sufficient ventilation for all ordinary purposes. What do you mean by ordinary purposes?

A. I mean the ordinary circulation or ventilation of that compartment.

Q. You mean if there are no leaks?

A. Even if there is a minor leak.

Q. Do you contend that those openings would create any circulation through the tank compartment?

A. I do.

Q. Do you think that would be quite adequate to air it out if there was a leak in the gas tank?

A. A minor leak in the gas tank, yes.

Q. That compartment under the tanks went down to the skin of the ship at the bottom, did it not?

A. That compartment?

Q. I mean the space under the tanks.

A. Yes.

Q. And the engine floor was, I think, about seventeen and one-half inches above the skin of the ship, was it not?

A. As I recall it, that is the measurement; yes, sir.

Q. And this square opening in the bulkhead, the lower part of it was on the level of the floor of the engine room, wasn't it?

A. It was.

Q. Then for seventeen and one-half inches below that, the space below the tanks, that space would be below the level of the lowest ventilation in the engine room, would it not?

A. It would, through that hole.

Q. What circulation do you think would take place that would induce gasoline fumes out of that lower level to—

A. Any movement of air across the top would have a tendency to circulate the air, even down to the bottom of the bilge.

Q. What was over the tank compartment on the deck above; can you tell me that?

A. I don't know.

Q. Do I gather it is your opinion that ventilation of a vessel of the type of the Seminole was principally for the purpose of keeping moisture and mildew out of the vessel?

A. That is the purpose of putting ventilation in a boat.

Q. On a boat that is equipped to operate on gasoline fuel do you say that it is not necessary to plan your ventilation to take care of accidental leakage of gasoline or fumes into the bilges?

A. Why, it is not necessary to figure any accidental leaks.

Q. In other words, you are going to plan your vessel on the theory that there will be no accidental leaks, is that right?

A. That is correct.

Q. And you are going to assume that all of the tanks and fittings will at all times remain tight?

A. Reasonably tight, yes.

Q. And you would plan a gasoline propelled vessel on that principle?

A. I certainly would; I certainly wouldn't make any ventilation sufficient to carry off five hundred or two thousand gallons of gas.

Q. I haven't suggested that, Mr. Munroe. That is all.

Mr. Underwood:

That is all, Mr. Munroe; thank you.

3581 Thereupon, R. C. ALLEY, a witness in behalf of the Respondent Phipps, resumed the stand and was examined and testified further as follows:

Direct Examination.

By Mr. Underwood:

Q. Mr. Alley, do you recall the testimony of Mr. Anderson of the Palm Beach office that certain entries in the books of the Seminole Boat Company were allowed to accumulate for a time before being posted in the books?

A. I do.

Q. Do you recall the fact that that occurred?

A. It did occur.

Q. Are you in a position to tell the reason for that?

A. Yes.

Q. Was it done under your direction?

A. It was.

Q. What was the reason for that?

A. Following the fire which consumed the Seminole the expenses incurred in connection with it were of more than one class; there were the ordinary corporate expenses, and in due course we began to have a lot of litigation expense and, as you know, the suit here now is brought against Mr. John S. Phipps; it is not brought against the Seminole Boat Company; so the question came up as to which expense was chargeable to the corporation

and which expense was a part of the expense of the litigation. We adopted the practice of allowing them to accumulate in a suspended condition in the Palm Beach Company's office, and then periodically separating them into two classes; the latter was done largely by Mr. Underwood. These separations took place at various intervals; I forgot just how many different times we went through the process of separating them, and when that was done the journal vouchers were made up for the corporation, and expenses of the other character were charged to the proper account.

Q. The purpose was to obtain legal advice as to which was properly chargeable against the company and which against others?

A. That is correct.

Q. Do you recall for what purpose—I think it has been offered in evidence or marked in some way—the release that Mrs. Abel gave?

A. Yes.

Q. I think there has been some comment on the fact that that release is of the Seminole Boat Company. Who prepared that release?

A. You or your office prepared it; whether you did it personally or not, it came from your office.

Q. Did John S. Phipps have anything to do with the preparation of that release?

A. No.

Q. Or with reciting what names of persons to be released should be inserted in it?

A. No.

Q. Now in your position as Vice-President of the Seminole Boat Company have you had anything to do with the payment of taxes by your company, in the making of returns, tax returns?

A. I had this to do with it: it is my custom to see to it that the corporation files the various classes of returns which it had to file; there were a number of them.

Q. What can you tell us, first, about the Federal Income Tax Returns?

A. It naturally had to file a Federal Income Tax Return.

Q. Do you know of your own knowledge if that was filed each year since the corporation was formed?

A. I do.

Q. How about the Florida Capital Stock Tax?

A. Well in the early days of the corporation that was not required, but I think since 1931 it has been required; it has been filed since 1931 regularly. There was no Capital stock Tax prior to 1931.

Q. From the time the Florida Capital Stock Tax became effective as a tax has the Seminole Boat Company made a return and paid that tax?

A. It has each year.

Q. How about the Delaware Capital Stock Tax?

A. I didn't have very much to do with that excepting to know that someone was attending to it.

Q. How about the Federal Capital Stock Tax?

A. Since there has been a Federal Capital Stock Tax returns were made and filed.

Q. By the Seminole Boat Company?

A. Yes. I don't recall the exact year that began; I think it was 1933.

Q. Were they made and filed by the Seminole Boat Company?

A. Yes, by the Seminole Boat Company.

Mr. Underwood:

That is all.

Re-Cross Examination.

By Mr. Matteson:

Q. Mr. Alley, at the time this release that you speak of was prepared by Mr. Underwood's office, was Mr. Un-

derwood's office representing John S. Phipps in this litigation?

A. Well, I don't recall whether there was any definite arrangement at that particular time that he was employed specifically by John S. Phipps; I don't recall the date of the release or the date of the litigation against him.

Q. Mr. Underwood's office has been acting for John S. Phipps ever since this litigation against Mr. Phipps has been instituted?

A. I assume that probably he has been acting for John S. Phipps and all others connected in any way with his corporation since the first time he was employed. Wherever there is a loss there is usually a lawsuit and usually they pick out the party who has the most money; so naturally anybody that was remotely or directly connected with the Seminole Boat Company, you might say, would be protected.

Q. Now, when you said that Mr. John S. Phipps knew nothing about this release, I take it that you meant simply that as far as you know he knew nothing about it?

A. That is right; I didn't tell him anything about it.

Q. You mean that you yourself never discussed it with him?

A. I never discussed it with him, no.

Q. Who was it that paid this Delaware Capital Stock Tax; you say some one else was taking care of that?

A. That was delegated to Mr. Weiss in the New York Office, or Mr. Ruelbach Anderson; I think his exact function was to see that it was filed; he did not prepare it.

Q. It was taken care of by someone in New York?

A. That is right; he mailed it here for signature.

Q. These expenditures that you have spoken of that were held in suspension, they were made in the first instance by the Palm Beach Company, I take it?

A. Yes; I think most of them were made by the Palm Beach Company; I don't recall that the Palm Beach Com-

pany paid anything directly to Mr. Underwood's firm; there may have been something at that time—

Q. Between the time that these items were disbursed by the Palm Beach Company and eventually allocated, how were they charged on the books of the Palm Beach Company?

A. They were charged in the expense account; some of them may have been charged directly to the Seminole Boat Company, because obviously they were expenses of the Seminole Boat Company; to a large extent they were suspended, as I recall.

Q. They were not charged to any other account?

A. Simply to expense account.

Q. I think you said you consulted Mr. Underwood and you made a division on several different occasions?

A. Yes. In a number of cases there were journal vouchers made up subsequent to the fire, I believe.

Q. Journal entries were made up for each year?

A. No, I think they were more than that; I have them here before me, however.

Q. They were made up in any event yearly or—

A. Yes.

Q. I take it that these allocations were made after consulting Mr. Underwood within these periods?

A. That is right.

Mr. Matteson:

That is all.

Re-Direct Examination.

By Mr. Underwood:

Q. I take it that your employment of my firm, from what you say, was for the benefit of "To Whom it May Concern"?

A. Yes.

Mr. Underwood:
That is all.

Mr. Matteson:
No further questions.

(Witness excused.)

3587 Thereupon GEORGE W. GIBBS, was called as a witness in behalf of the Respondent Phipps, and having been first duly sworn, was examined and testified as follows:

Direct Examination.

By Mr. Underwood:
Q. Where do you live?
A. Jacksonville, Florida.
Q. What is your business?
A. I am an engineer.
Q. What is your principal business or occupation?
A. Manager of the Gibbs Gas Engine Company of Florida.
Q. Is that company named for you?
A. Yes.
Q. How long have you resided in Jacksonville?
A. Since 1911—since about 1910.
Q. What was your education, if any, along engineering lines?
A. The Georgia School of Technology; I hold a degree of B. S., Batchelor of Science, in the art of mechanical engineering.
Q. Do you know what year you got that?
A. 1908.
Q. How long have you been in the engineering business?

A. Since the day I left school; and before that I was employed as an engineer while at school in my senior year, and since that time I have been continuously in business.

Q. What type of engineering work have you done over the years?

A. Worked very largely in connection with internal combusion engines and hulls of vessels.

Q. Hulls of ships?

A. Yes, which includes fire fighting apparatus, the design of fire boats, stationary fire fighting apparatus such as used to protect municipal docks, warehouses and things of that kind. I have also acted in a consulting capacity in the past with such people as Mr. Louis Shane of the Southeastern Tariff Association, the engineer in the south who determines rates or rates reflected by risks; have consulted with Mr. Booth, president of the National Underwriters Association—I believe that is the correct name—in connection with the conversion of submarine chasers into fire boats for the protection of harbors.

Q. What type of equipment does your company have for the construction or repair of vessels?

A. We have a drydock that cost $100,000.00, one hundred ton capacity; a marine railway, and drydocks sufficiently large enough to lift almost any yacht that floats.

Q. Does your company have facilities for construction of vessels?

A. Yes.

Q. How many at one time?

A. Eight or ten.

Q. Have you built any vessels?

A. Yes.

Q. When did you personally begin to have supervision of the construction of vessels?

A. Along about 1911.

Q. What type of vessels have you constructed at that yard under your supervision?

A. At that time we designed them and had them built in other peoples' yards.

Q. When you say you designed them, can you tell us whether they were designed under your supervision?

A. They were.

Q. You had other people build them?

A. Yes.

Q. When did you begin building them yourself?

A. In 1916 or 1917.

Q. Will you tell us approximately how many vessels over the years have been built under your supervision?

A. Several hundred.

Q. What types of vessels do they include?

A. Include what I would say are the finest types of hulls; we don't do any work that goes into the low price work; the work is for the government; 95% of our work is for the government, the oil companies or the rich yacht owners; I mean the yacht owner who will pay, for instance, one hundred thousand dollars.

Q. Have you built any gasoline propelled vessels?

A. Yes.

Q. What types of gasoline propelled vessels?

A. We built submarine chasers, 110 feet in length; sixteen.

Q. Sixteen of those?

A. Yes; ten for the American government and six through the American government for the French government.

Q. What type of motive power did they have?

A. They had 220 horsepower Standard gasoline engines; three in each hull.

Q. What was your personal connection with the design or construction of those vessels?

A. I made the estimates of cost, with the assistance of an able staff, and personally looked after the details of the construction and had charge of the organization of the personnel.

Q. What other types of vessels propelled by gasoline have been constructed under your supervision?

A. We have built more boats for the Coast Guard, Army, Navy and other branches of the United States government than any builder in the southern states, and perhaps the fourth builder in America.

Q. That your company is the fourth largest builder of vessels?

A. Of small vessels, meaning up to 110 feet.

Q. Have you built any tankers?

A. Yes.

Q. What types of tankers?

A. We built tankers for the Standard Oil Company of New Jersey, for the Gulf Refining Company, for the Seaboard Oil Company—they have three or four names; I think it was the Pure Oil Company we built them for; we also built a great many for Cuba for carrying sugar; these Cuban boats were intended to carry sugar, and they were quite large vessels.

Q. In the construction of tankers do you have to consider the hazards of inflammable oils?

A. Yes.

Q. I noticed out of my hotel window a little gasoline supply station off to the side; did you have anything to do with that?

A. We built that, and also the Texas Company, the boat that was used here by the Texas Company.

Q. The one I speak of is for what company?

A. The Standard of Kentucky.

Q. You said something about building fire boats. Can you tell us something about that?

A. We built a fire boat for Galveston, and as I remember it the price was $208,000.00; it was a steel fire boat.

Q. Did that construction consist solely or only partly of steel hulls?

A. Entirely steel construction with gasoline engines.

Q. I mean all of this construction you have just spoken of; was it all steel hulls?

A. Yes.

Q. Have you built any wooden hulls?

A. Yes.

Q. You have?

A. Yes; the "Miller" was a wooden tanker and, as I remember it was about 150 feet long.

Q. Carrying fuel oil and gasoline?

A. Yes; she had tanks inside of her.

Q. By the way, are you building any ships today?

A. Yes.

Q. What kind of ships?

A. We are building some ships for the army—we have just completed—the contract is not exactly finished because there are some drawings to be submitted; we built 16 rescue boats for the Coastguard; just before that we built, I think, the finest ships that the Coastguard owns; five of the 30 mile boats, 80 feet—

Q. Are these boats capable of 30 miles—

A. 1600 H. P. cruisers, 80 feet, 30 miles.

Q. These 16 boats for the Coastguard—

A. They were just delivered.

Q. Are they to be gasoline propelled?

A. They are gasoline propelled.

Q. In addition to ship construction, does your company do any repair work?

A. That is the bulk of our business.

Q. Have you had occasion to repair yachts from time to time?

A. A great many.

Q. Gasoline propelled among others?

A. Yes.

Q. Have you seen them yourself?

A. Yes, sir.

Q. Been down to their engine room?

A. Yes.

Q. Are you familiar with the general type of construction and layout of engine rooms of gasoline propelled yachts?

A. Yes.

Q. Gasoline line fittings and so on?

A. Yes.

Q. The type of gasoline tanks they have?

A. Yes.

Q. Are you doing any work on any yachts now?

A. Yes.

Q. How many in a general way and briefly what sort?

A. We usually have from two to nine at the yard.

Q. How many are there now?

A. There are two there today.

Q. Two yachts?

A. That I know of, and I think there were three others on the way. How many are there today I don't know; I do know there are at least two there today.

Q. They were there Saturday when you were last there?

A. Yes, and I hope they are gone.

Q. Now, Mr. Gibbs, have you been aboard the Seminole since the fire?

A. Yes, sir.

Q. Do you remember ever being aboard her before the fire?

A. Yes, sir.

Q. When was that?

A. When she was at our yard when we did extensive work on her.

Q. Do you recall when that was?

A. Before her gasoline engines were put in her; it was when she was a steam yacht; I think it was about one of her first trips to Florida.

Q. That was a number of years ago?

A. Yes.

Q. Since the fire you have been aboard of her here at Miami?

A. Yes, sir.

Q. On two or three occasions?

A. Yes.

Q. Too what extent have you examined her?

A. Well, I have examined her to see if I could find what her construction was, what the installation of the gasoline power consisted of, and to find if I could any cause for the catastrophe, and I have hunted for such things as I thought might be of interest in determining whether the boat was faultily constructed or not.

Q. Have you been down in the engine room?

A. Yes.

Q. Looked in the tank compartment?

A. Yes.

Q. Looked over her hull forward of the tank compartment?

A. Yes, but not to any great extent. I didn't understand that there was anything up there in question.

Q. Have you looked at her hull abaft the engineroom?

A. Yes, but not in much detail. I did observe where the gasoline engines probably were.

Q. Did you observe where they are now in the engineroom?

A. Yes.

Q. Where the windlass is up forward.

A. Yes.

Q. The location of the auxiliaries in the engine room?

A. Yes.

Q. Have you observed what remains of the gasoline feed-line system?

A. Yes.

Q. The manner in which the gasoline tanks were constructed, in a general way?

A. Yes, sir.

Q. How they were situated in the tank compartment?

A. Yes.

Q. You understand that the gasoline tanks had inverted crown bottoms and could not be entirely drained?

A. Yes.

Q. In your opinion is that a proper or improper condition under the circumstances?

A. I think that is entirely a proper condition; I don't see how it could have been done any other way.

Q. There has been some suggestion in the case that water condensing in the tanks will settle in the bottom and possibly cause corrosion. In your opinion would that process occur in any substantial degree in these tanks?

A. No; the corrosion would be absolutely negligible from any such cause.

Q. Why do you say that?

A. In the first place, practically every tank of that type in a yacht is installed exactly that way; in the second place, the amount of corrosion is caused by oxidation knitting with the metal, causing rust, and you have various stages of the process. The water which would undoubtedly come from the atmosphere on condensation would sink to its lowest point, and then it would become a protective fluid preventing further corrosion; it would have a very minute amount of oxygen in it free; that is a very great distance from any place that could have ever been affected by air in the fluid, and the water itself, which I believe and in fact know, would have been as high as the drain close to it, and with the amount of oxygen that got up in there, it would have been almost negligible. I would expect to see almost a shiny surface it was if blue-black steel.

Q. Let's assume a particular square inch of that surface in the "V" at the bottom of the tank does become rusty due to oxidation down there, is that process a continuous one?

A. No.

Q. What happens to it.

A. If the air is held away that becomes in itself a protective coat.

Q. What?

A. Rust.

Q. Can you give us any example of that?

A. Well, red lead itself that you put on bridges, some forms of it, is ground rust and linseed oil.

Q. What about red lead that is put on ships?

A. The same thing.

Q. You mean in effect?

A. I mean in effect that there is a form of paint that is ground rust that may be produced in a chemical way; but in fact it is rust with an oil holding it together.

Q. The purpose of red lead is to prevent rust?

A. That is right. It is like—metal will only yield so much oxidation, provided it is impervious below; water, for instance, cannot burn. The reason water cannot burn is because it has already burned; it has oxidized; water is oxidated hydrogen; hydrogen and oxygen unite and you have hydrogen and oxygen; H_2O is water, that is, ashes of water; water is the ashes of two other substances which combine, and having combined they cannot combine further, and on that theory one of the best things you can do to a plate is to clean it and let it rust, with a fine coat of rust, and then cover it and keep air from it.

Q. Did you observe the filler pipe of the Seminole, or do you understand that the filler pipe of the Seminole was a two-inch pipe and vented by the use of a half-inch pipe?

A. Yes.

Q. In your opinion is that a proper or improper condition?

A. I believe those are about the right sizes; I believe if I had been doing it I would have made an even smaller pipe as a vent.

Q. Is there any disadvantage in having the vent pipe smaller than the filler pipe?

A. On the contrary it would be very much a disadvantage if you had your vent pipe a larger pipe.

Q. If your vent pipe is large, what is the disadvantage?

A. Then you have convection setting in to change the nature of the air that is on top of the top portion of the tank.

Q. Does that mean it facilitates the evaporation of the gasoline?

A. It would facilitate the evaporation and tend to cause condensation under certain conditions. The airplane, for instance, the minute she lands they immediately fill her tanks, the idea being to prevent water from getting into the tanks through the tiny vent that the airplane tank has and to prevent excess condensation where that water might get in; it might get in the carburetor.

Q. Assuming that the filler was a two inch pipe with a half inch vent, in your opinion was that sufficient to take care of the outward movement of the air from the tanks?

A. I think it would be quite sufficient. Of course you could deliberately slow the gasoline going into your filler pipe, and you might, under high pressure, put it in faster than you could vent it, but it would have to go in very fast—too fast for the venting of air. Air travels with very little friction; it comes out of a hole in almost no time as compared to the time required for a liquid to go through the same passage.

Q. Now did you see any pans under the gasoline tanks?

A. Yes, I saw them.

Q. How many did you see?

A. Two pans; two under each tank.

Q. You mean two tanks under each pan?

A. That is right.

Q. Did you observe in a general way the size and shape of these pans and the material of which they were constructed?

A. Yes.

Q. Did you observe any overboard drain from these pans?

A. No.

Q. Did you observe any fittings from which they may have been drained?

A. No; I heard there were; I regarded the pans as so much unnecessary construction. I thought I would be in a position to remember what they were like; anyway, I wasn't much concerned.

Q. From your experience with vessels burning gasoline for fuel was it reasonably necessary to have any pans at all under those tanks?

A. They were the first pans I have ever seen in my life, and I have perhaps seen as many ships as any living person, with the possible exception of an insurance surveyor.

Q. Have you ever installed any drip pans on any gasoline tanks for the Navy or Army or oil companies or anybody else?

A. Never. I would as soon drink water with a big glass to catch the drip off my lips as a little glass. I can't conceive of any justifiable purpose of these pans there.

Q. Did you observe how the gasoline tanks themselves were bedded in the pans and secured?

A. Yes.

Q. What did you observe, in a general way, as to that?

A. That, in my opinion, was a most excellent job; I think that that was even done better than anything; I can conceive of no load on these tanks that would ever have made it necessary to fit wooden supports up to the shape of the concave and convex parts of the tanks; convex and concave must be construed from the viewpoint of where the tanks are; concave with respect to the bottom, the fitting of the wood to the bottoms of those tanks was a very careful job, and in itself practically would have prevented any shifting.

Q. In your opinion?

A. Yes, forward or aft.

Q. In your opinion were they adequately secure?

A. They were. All that you could see; I saw a splendid fastening at the bottom of the tanks, as well as a splendid fastening about 15 inches up, and then the columns were burned off. I think that one might assume, from what existed, that those columns were joined continuously up to the top of the tanks, tending to hold the tanks rigidly. I don't know that those things were there, because they were burned up; at least we could so surmise—

Q. From your experience in ship construction is it a fact that what you saw leads you to believe that they were there?

A. Yes. I would say that half of that amount of stiffening would have been quite sufficient for that job.

Q. Did you observe that the tanks rested on wooden bottoms?

A. Yes, sir.

Q. Anything improper about that?

A. I think that was highly proper.

Q. Considering ~~the~~ possibility of leakage from the tanks, do you think that these wooden bottoms were proper in that construction?

A. I would not have given any consideration at all to any possibility of a leak in these tanks, and I would have put no form of support in with any thought whatever of leakage of fuel out of these tanks.

Q. Did you observe that they fit very closely to the bulkheads in the tank compartment?

A. Yes, I did; the frames to the tanks were grouted and fitted.

Q. Do you understand that it was not possible for a man to circulate freely around these tanks to examine them?

A. Yes, I do.

Q. In your opinion was that a proper or improper condition?

A. With those tanks it was totally unnecessary for them to be subject to inspection.

Q. Why?

A. Because the tanks were good for a hundred years in their present condition, long after many ships of that age would be lost. The tanks were made for some other purpose, and they were very much heavier. Now you have only to look at this gasoline tank to see the gauge of it—

Q. Exhibit 137?

A. Yes.

Q. In your opinion is it necessary for tanks to be installed such as on the Seminole so that they can be subject to visual inspection?

A. It is not.

Q. What has the practice been?

A. In some installations the tanks are subject to inspection, but that is more accidental than by design; it just works out that way; but in the finest ships afloat, many of them, the tanks are put in like the flue in a building; they are under floors, under joiner work, and I myself have just built a boat for Mr. Ellis and the tanks are built with very extensive joiner work, and it is not contemplated that they will ever be inspected; they are covered with a coat of red lead and they are made of steel plate, and I would say that at least 60% of all yachts afloat are built with tanks—built into the ship with no view of ever inspecting them or seeing them again.

Q. Are you familiar with the modern construction of stock boats?

A. Oh, yes.

Q. Are those tanks generally subject to physical or visual inspection?

A. No.

Q. Does it make any difference in your opinion as to the need for visual inspection, whether they are made of copper or galvanized iron or steel or what sort?

A. Well, a tank in a ship is not made because of the need of a "boat"—tanks must be used in places not used for cargo, whether human or dead cargo; it is therefore a most simple thing to design a tank to do almost nothing at all. We design tanks up to three-seven hundred pounds pressure per square inch; the yacht requires a tank designed up to four and five pounds per square inch. It is no difficult engineering job at all to design a tank that should be good for a hundred years in a yacht whose life would be 25 years.

Q. Mr. Gibbs, in your opinion is a hydrostatic test an adequate test for such tanks?

A. Of course it is.

Q. In your opinion would it be necessary in a vessel like the Seminole to subject the tanks to a hydrostatic test at any periodic intervals?

A. I would do that in case of a stray bullet from the gun of a huntsman piercing the hull of the ship, and there was some possibility of an abnormal accident like that causing a leak, or if there had been an accident in which the boat had run into another boat, or came into collision with another boat, in which I suspected that some strain came on the tanks, sufficient to throw the piping out of alignment,—then I would subject these tanks either to a hydrostatic test or I would pull them out; it is no great problem to lift the tanks out and remove a hatch in the case of such an accident. Barring such accident, I would never think of testing something good for eight to twenty times the required load that had been permanently installed.

Q. Now, Mr. Gibbs, remembering that the bottoms of these tanks were inverted crowns and the tops of them were also rounded, which properly would be placed at the bottom of the tanks, installed?

A. They should have been installed as they were; first, because you have your supports as far as possible from the center of gravity of the tanks, which is the law in any structure; the other reason is that that wedge-shaped place that has been referred to in the evidence received the water which in itself was a protection for the rivets.

Q. Which way could the tanks be more readily and better secured against motion?

A. My first answer would cover that, with that support for your tank as far as possible—in other words, if you support it the other way you would only have one point of contact.

Q. It has been stated that the rivets in these tanks were not welded. From your observation can you express an opinion whether they were welded or not?

A. The only place that there is much evidence of welding that I ever observed is where you have an old rivet in a tank that has rusted or reason to suspect a leak. Rivets have been used for a good many years, and there is no reason for a rivet to leak at all.

Q. In your opinion was it necessary to weld the rivets on these tanks?

A. I would object very seriously to having old rivets welded.

Q. For what reason?

A. For the reason that the very nature of the welding operation would have a tendency to destroy the thin edge of the rivet; it might apparently be sound. I have seen welding done in this feather-edge space, and where you have an improper amount of heat you merely create an unforeseen fracture and this feather edge breaks off. A rivet has a feather edge and the applying of heat at that very thin place is a most dangerous thing in my opinion. When the rivet is heated it should be thoroughly covered with the metal; it is almost impossible to make a welding of thin plate where one laps the other.

Q. Could you tell from your observation whether the seams of these tanks were caulked?

A. There was nothing about them to indicate that they were not caulked. A caulking iron is a very narrow tool for that kind of work—practically a square edge—which I could see on the tanks, the bottom portion, where there was room for such an iron. I can see no necessity for having caulked these tanks at all. These tanks, like all other tanks, are a type that are put under a very heavy pressure test, a test of possibly 100 pounds pressure; that determines whether they should be caulked or not; under a pressure considerably greater than the working pressure or working load.

Q. Have you calculated the pressure at the bottom of these tanks when filled with gasoline?

A. Yes, approximately three pounds; I am not giving it to you exactly, but in fluid, any fluid, is about two feet to the pound.

Q. Now in the light of the thickness of the material and the spacing of the rivets, was it necessary in your opinion to caulk these tanks?

A. No. I would like to explain what caulking is: you find a leak and you caulk it; if you do a good job, you may never touch the caulking iron again. The way these rivets are spaced I can conceive of no need for caulking at all. Where we caulk is where the hydrostatic pressure shows a leak, then that part is caulked. You do it that way.

Q. In tanks of this sort for use in containing gasoline, is there any rule for the spacing of the rivets?

A. Oh, yes.

Q. Will you tell us about that, please; what the rule is and why?

A. Of course, in spacing the rivets you must know the purpose for which the tank is built. That is the prime thing. First, to determine the tank's strength you get as efficient joint as it is possible to make, where the

strength is sufficient. If you had, for instance, a single ~~row of rivets you~~ would have a joint that could not be very efficient, because of the holes cut for the riverts—the rivets would go cross-section of the plate and the plate would give in between and crack, in the short distance between the holes in the plate. Now if you have double rows of rivets—sometimes three or four rows of rivets—the distance between the holes is increased, also the required number of rivets; so the rule for the spacing of rivets, where strength alone is required, the pressure is determined by an equation. In the matter of where strength is not the item, where the item is resistance to corrosion and resistance to leaks, there the rivets are placed singly in one row in order that the heads of the rivets almost touch each other or come so close to each other that, acting as a clamp, they then draw the two places or plates closely together and prevent the necessity of caulking or any other means of making a tight joint.

Q. For the purpose of preventing leaks it is desirable, is it not, to have the rivets as close together as possible?

A. That is right.

Q. And yet for strength, if you get them too close you destroy the—

A. —the tensile strength of the plate itself.

Q. By making holes in it?

A. Yes.

Q. Sort of like you would in a perforated piece of paper?

A. That is right.

Q. Considering the weight of the volume of gasoline that could be contained in these tanks and the head of pressure per square inch that would be on the bottom seam, in your opinion was there any necessity for double riveting the bottom seam?

A. None whatever; that would be ridiculous.

Q. In your opinion were the rivet holes unduly far apart?

A. No.

Q. Were they too close together?

A. No; they could hardly have been too close together for that problem; I would say they were spaced about right.

Q. Were you able to form any opinion from your observation as to whether the rivet holes in those tanks were punched or drilled?

A. There would be only one way to do that and that is to cut out a rivet and then make a microphotograph of it or look at it through a microscope. It wouldn't make a bit of difference whether they were punched or drilled for that purpose.

Q. Can you tell anything about any small irregularities in the line of the rivet heads as to whether the holes were punched or drilled?

A. Certainly not. You could take a gang punch and punch a plate like that; where everything is in line you can punch many holes at once; a man could take a punch that had four punches in it and punch four holes at one time, and it would be just as easy to throw the rivets out of line with a punch as it would with a drill. I will say, however, that if the rivets are out of line at all, it is just like as if they were—in other words, it is not a perfectly dead straight line, and that argues the fact that they were probably drilled. I don't believe that any shop to-day, with any tank of that kind, would permit drilling. The drilling was done with an old Stevens punch and ream or drill. When you take a thick piece of plate or boiler you have a tendency to distort the edge of the plate with this terrific pressure and you are apt to tear the metal apart. That requires that you ream out—you drill the hole and then ream the distorted section of the hole, and in that way you cure that trouble. In the matter of water tanks under these minute pressures, with the size of the height of the head, and the fact that the plate is so thin that you don't injure the metal when you

shear it, shear the hole,—under those conditions I don't think there is a tank manufacturer in the country that doesn't punch his plates.

Q. Can you get just as tight a river whether you punch and ream or drill it?

A. It would make no difference.

Q. Are they equally satisfactory?

A. Certainly; for this pressure.

Q. Looking at these tanks as a whole and bearing in mind the details which we have discussed, in your opinion were they proper tanks for the carriage of gasoline in the Seminole?

A. Entirely proper; much more desirable and much greater strength than was necessary. They apparently were designed for a purpose other than that of holding gasoline, and the purpose for which they were designed had more severe requirements than the purpose for which they were used.

Q. Now, the axis of these tanks was vertical, was it not?

A. Yes.

Q. In those cylindrical tanks were the stresses parallel with the axis of the tanks as great or greater than those at right angles with these stresses?

A. The stresses tend to rupture the tank, lift the top from the bottom, that is, lift one side from the other side; the stresses tend to rupture the tank and if the tank were to burst due to pressure it would burst in one of these two ways; nearly all tanks subject to pressure have two rows of rivets in their vertical seams or more, and half as many in their horizontal seams.

Q. Is that a recognized physical fact?

A. It is as simple as two times two is four; materials are placed to resist strains, and when a structure fails it fails in what is known as its weak section.

Q. Is that something every engineer learns in stresses and strains?

A. Every schoolboy in a technical school learns that; that is the first thing he looks at and he knows it for the rest of his life; it is the ABC's of design; find your weak section and provide for it; determine where it exists.

Q. I call your attention to a valve on a section of pipe, marked Libelants' Exhibit 2. Have you seen that valve before?

A. Yes.

Q. Can you tell us whether or not in your opinion that is a proper type of valve for the gasoline feed-line on the Seminole?

A. Most assuredly. It is like nearly all of them that are used for the same purpose; I will say that 95% of the valves used for that purpose are like that.

Q. Can you tell us whether or not that valve would leak now?

A. I don't think this would leak now under any pressure—of course whether it would leak now or not would be determined by whether it had a composition seat or a ground seat; if it had a composition seat and it is has been through a fire, that is destroyed. If it is a ground seat it would perhaps hold the gasoline pressures, the pressures that would be required in that yacht; this was probably for, in my judgment, around 135 or maybe more pounds pressure, liquid pressure.

Q. Does it make any difference in your opinion whether a valve has a ground seat or composition seat for use in a gasoline feed-line?

A. Very little. The only thing I would be particular about is not to have a rubber seat where gasoline is used, but any other form of composition I think would be all right. We have used them both for many years—in usually what is known as the globe type of valve.

Q. Now on this same exhibit 2, the next fitting beyond the valve, apart from the T, is a union, is that correct?

A. Yes.

Q. There has been some suggestion in the evidence that that union has been expanded. Do you see any evidence of that?

A. To my eyes I don't think it has been; there are some wrench marks on it that would create an optical delusion, but if you will look at the other piece turned to me you will see that that is cylindrical and not tapered. We are usually accustomed to looking at tapered things, and we are so accustomed to looking at things of that kind having a slight taper this way, it would appear as if perhaps this burst out this way (indicating); these are the marks of a Stilson wrench. This one seems to me to have no greater —it seems cylindrical.

Q. Indicating the metal end—

A. I can't see that that has expanded at all; in the first place, if it were expanded I think you would see quite a wide crack—because there is considerable pressure in there, and I don't think you could stretch that and I don't think you would crack it. Even if it were cracked here (and I can't see the slightest sign of it), you could still drive it up tight, because you would have a great deal of metal which acts as a reinforcing agency.

Q. Do you see anything about this union that would indicate to you that it leaked?

A. Nothing at all; there is not a thing about it to show that that is defective at all.

Q. Look at the female part; do you see anything about that which indicates that it would leak?

A. No; I think that would be good for 125 pounds pressure this minute, although it has been through a fire; it looks to be in splendid condition; I can see nothing wrong with it at all, except dirt.

Q. Mr. Gibbs, do you understand that there was in the Seminole a pair of valves for the drawing off of gasoline?

A. Yes, sir.

Q. And as a matter of practice in a vessel of that type is there in your opinion any reason why there should not be such a contrivance in the engine room?

A. No, sir.

Q. What are your reasons for that?

A. The absence of such a contrivance as that would have made necessary, as a practical matter, a procedure which would have been even a much greater hazard to the ship. I regard this as the best solution of the problem.

Q. Now, Mr. Gibbs, before we go further with that, let me ask you a question or two about your familiarity with gasoline engines. Have you ever built gasoline engines?

A. Yes, sir.

Q. Did you design one yourself?

A. I designed several gasoline engines.

Q. Did you develop some new type of gasoline motor?

A. Yes.

Q. Gasoline engine?

A. Yes.

Q. Tell us a little more about that.

A. I designed a seaskiff with a two-cycle engine, similar to the engine now being used on these midget racers, and I designed a heavy duty four cycle engine.

Q. From your experience with motors are you able to express an opinion as to whether or not the motors of the Seminole would have to be primed?

A. I think that that was largely a matter of habit, depending on the skill of the engineer; it relates to the adjustment of the carburetor, the setting of your spark lugs and the "hotness" of your spark and so forth. Certainly engines would have been a very useless piece of apparatus if provision had not been made for priming. I think that the engineer on the Seminole did the wise thing when he provided for priming, and unquestionably he did prime liberally and almost without exception when he started his engines.

Q. From your experience would you say that it was necessary to prime these motors when they were cold?

A. From my experience, and I have owned two of similar engines myself, I think it is very necessary to prime them.

Q. How about when they are hot?

A. Well, sometimes you may have to prime them more then than at any other time.

Q. Depending on some of the considerations which you just recently mentioned?

A. Yes; depending on the fact that you have lost your mixture; it is a very temporary thing—it is governed by the moisture, mixture, heat and other things.

Q. I show you a device; can you tell me what that is?

A. That is a priming cup made for the purpose of priming engines.

Q. It has already been marked in evidence, but it does not bear a tag. Is that a proper priming cup in your opinion?

A. Yes; that is the universal type.

Q. Now considering that it is necessary at least sometimes to prime the Seminole's motors to start them, does that have a bearing upon the desirability of having draw-off valves for gasoline in the engine room?

A. A very great bearing.

Q. Tell us what that bearing is and your reason?

A. From my experience with the operation of gasoline engines, from the time I used to run them as a kid up to the present time, priming of large engines, particularly this type, is quite necessary, especially where the air has been let out. When she loses her air it is a very difficult thing to get it again. In most of the boats, where there has been no provision such as this, the engines have been primed by the breaking of the gasoline line, a most dangerous practice. Of course you might have your priming squirt cans, but it is not always necessary to prime an

engine. Take your automobile, you used to prime those, but you don't have to do it much any more. The grade of gasoline has more to do with it than perhaps anything, but the point is that the operation, one that is not fixed and necessary and variable, calls for being unprepared with a squirt can full of gasoline—for instance, your squirt can may be full and you may use it and you may not; you may think it is full and you rush to it, and you find that you don't have it, or something has happened to it, maybe a neighbor yachtman has come over and borrowed it to get enough gasoline to get him to town, and it is gone. What does he do? He does exactly what Mr. McCoy said he did; he breaks his line to get gas, just as Mr. McCoy said he did, takes the frying-pan and puts it in the line and—

Mr. Botts:

I object to the reference to what Mr. McCoy said he did.

The Court:

Don't refer to any other testimony.

Mr. Matteson:

As a matter of fact, Mr. McCoy did not say that he drew off gasoline in any such fashion.

Q. Mr. Gibbs, in your opinion, in view of the necessity for priming the Seminole's motors, it is better to have a supply of gasoline or place to draw it off in the engine room or elsewhere?

A. By all means it should be in the engine room, where you have a man skilled in its use.

Q. Now assuming that gasoline was drawn off from the tanks of the Seminole and used in a number of fishing boats and outboard motors, in your opinion is it better

that it be done from a drawoff valve in the engine room or elsewhere?

A. It should be done in the engine room.

Q. Why is that?

A. For many reasons. In the engine room is a man who is skilled in the use of gasoline and in the use of tools. That is the place most easily protected and equipped to handle this gasoline, and so long as gasoline must be used there it would be better to use it from one central station by a skilled man than to have it at large on the vessel.

Q. Now can you tell us from your experience with yachts and houseboats in Florida waters whether or not it is customary for vessels to have such a device?

Mr. Botts:

I object to that; what is customary on other vessels doesn't make it safe.

The Court:

Of course what is accustomed is involved in the formation of his opinion. That is part and parcel of it. I think now he is testifying as an expert from a theoretical standpoint as to what is safe. I think you had better confine this and exclude what is the custom on other vessels. Read the question, Mr. Colman.

(Preceding question read by the Reporter.)

The Court:

Now, I am going to overrule you, Mr. Botts. That goes to the quality of the testimony. That is a good question asked of an expert. I think that is all right; you may answer the question.

A. I will say that I have seen it many times. I have had it in my own boats and on boats of perhaps the most

careful operators. I know that they use it in the most expensive boats, and even in those vessels using Diesel engines with crude oil, gasoline has been piped into the engine room so that the engineer could have complete control of the use of gasoline. In the olden days most all carburetors had a petcock built into the bowl in order that gasoline could be drawn off; it is almost a universal practice to catch gasoline in a sponge or rag when you reach around to prime the engine. I personally have done it many times.

Q. Now getting down to these two particular valves themselves, Exhibit 11; did you notice that one is Crane 150 and the other Crane 125?

A. Yes.

Q. Have you examined these valves?

A. Yes.

Q. In your opinion are they proper valves for that purpose?

A. Yes.

Q. What does the 150 and 125 mean?

A. Indicates the pounds of water pressure they carry.

Q. Water or anything else?

A. Yes; possibly not steam.

Q. Roughly, what is the margin of safety on these valves for the comparative head of gasoline on the Seminole?

A. Roughly it is about 3000 per cent; these are three thousand times as strong as necessary.

Q. You mean three thousand per cent?

A. Well, they are required to hold four or five pounds and they hold 125 pounds; say an average of 130 pounds, and four into 130 goes about 30 times, or better than 30 times, so they are better than 30 times as strong as necessary.

Q. Now have you observed that one of these is a ground seat valve and the other a composition seat valve?

A. Yes.

Q. Does that affect your opinion in any way?

A. No, sir. I think if I were going on a long cruise I would take the ground seat valve, if I was at a place where I was apt to lose my source of supply I would take care of the ground seat valve in the field a little better. This is the composition seat, and it is a splendid valve with a floating seat.

Q. Do you see anything about that valve today that indicates any leakage?

A. Of course this will leak without the seat.

Q. Apart from the absence of the seat?

A. Apart from the seat it looks to be in very good condition; it is a first-class valve.

Q. Do you know of any such thing as a valve especially made for gasoline?

A. I never heard of it until I came into this trial, and I don't think I have heard of it since. What I have seen in catalogs would lead me to believe that there was no such thing. I know in filling stations and places like that handling gasoline they have a valve, but never, until I came here, have I recognized that there was a thing called a gasoline valve. Now I am not referring, of course, to throttling valves or so-called plug valves where motor throttling has to be done.

Q. Now, Mr. Gibbs, turning to the connection between the valve marked Crane 150 and the nipple, do you observe the condition of the nipple between these two?

A. Yes.

Q. Do you see anything wrong about that?

A. I would say that the threads are a little too close; seems to be pretty good threads, but the threads are so close that that nipple was a little small to crew this thing, but if it didn't come to the shoulder it could be screwed until the taper goes on across and passes it and becomes tight. Now the engineer, in setting up or using that nipple, had to do one of two things, either to cut this shoulder down so that this could be screwed further up

on the tapering threads, or to see that he had the equivalent of a ground fit; he had a minus edge here and a minus edge here—

A. Indicating the absent edges of the valve and the nipple?

A. Yes; his other edges are simply to tighten that up, to have what is the equivalent of a copper connection which is used in copper tubing.

Q. Do you see any reason why that valve would leak at that point?

A. No; I think we can say that there is no reason for that to leak at all; it makes an excellent job, and I think that would be good for 100 pounds pressure today, which is 25 times more than required. Incidentally, there are two valves on that job.

Q. I am just coming to the next valve now. Turning now to the valve marked Crane 125; that is a ground seat valve, is it not?

A. Yes.

Q. In your opinion is that an adequate valve?

A. Yes; I have examined this carefully and I think it is good for 125 pounds today, and 20 more years of service.

Q. I call your attention to a nick in the plug of that valve. Does that have any effect on the ability of the valve to hold?

A. I don't think that is a nick; it looks a little to me as if that was in casting, that when this thing was in the process of being cast that that was a place where the metal didn't flow at that point, but that has nothing to do with the tightness of that valve, because that is not the seat.

Q. Where is the seat?

A. The seat is the place that attaches on here (indicating)—

Q. Referring to the seat in the valve bowl?

A. Yes; I don't think, just from my eye, that that seat would touch this area at all (indicating).

Q. Referring to the area of the nick?

A. The area affected by the nick, yes.

Q. All right.

A. I get that from th fact that the valve is as tight as possible right now.

Q. How can you tell that the valve is tight now?

A. Have somebody blow in it.

(Thereupon the Court blew through the valve.)

Mr. Underwood:

Did you get any air through?

The Court:

I don't think so.

A. Anyway, I think that will hold 125 pounds just as it is now.

Q. Is there any simple test we could make to see whether or not that nick comes in contact with the seat?

A. Yes, you could take calipers and measure in there. I don't have any with me. You could put a mark—

Q. How about a piece of chalk?

A. I think that would show it. Of course that is a floating seat, too, and the minute it impinges on something it stops, so it doesn't tend to scratch the shoulder any, but when we take it, to where it is supposed to seat, it went right there and stopped short. Now we will take it where it doesn't quite touch; it is tight now; now that is too tight; now take that up a little bit. Now take this and just turn it around, let up on it just a little bit; slack it up; tighten it a little bit—slack it up.

Q. What does that show as to where the chalk is worn off?

A. The chalk is worn off a great distance from where the flow is.

Q. Before you take any of the chalk away tell us approximately what the distance is—

A. Maybe 1/8th of an inch.

Q. Will you indicate to the Court where the contact was?

A. Right here. It will show a little more if we run it around; if you run it around it will show a ring, but you can tell by the eye that the diameter of that nick—that the circle in which that nick occurs, is much greater than the diameter of the seat. That seat is a rather small thing.

Mr. Matteson:

Won't you get a good impression if you screw it down tight?

A. You can; do you want me to do that?

(By Mr. Underwood):

Q. Yes; go ahead.

A. All right; that shows it—you have to give it a little twist; it is pretty hard to twist this thing with your hand.

The Court:

Let me see it.

A. The float is here, sir; it is maybe half an inch away from the area affected.

Mr. Underwood:

May I make a statement on the record?

Mr. Matteson:

Yes.

Mr. Underwood:

The witness marked with chalk the bottom portion of the plug; then inserted it in the valve and made contact

between the plug and the seat, and turned the plug will in contact with the seat to obtain a mark on the surface with chalk to show where the plug was in contact with the seat; having done that, he withdrew the plug from the bowl of the valve, and the whole thing was examined by the Court and counsel. Is that an agreeable and acceptable statement?

Mr. Botts:

No, I won't agree to any statement you make. I won't agree to a thing that you say.

Mr. Underwood:

You do that on general grounds and not on the ground that my statement is inaccurate?

Mr. Botts:

I don't know whether your statement is accurate or not, but I won't agree to it.

(By Mr. Underwood):

Q. Mr Gibbs, did you hear my statement?

A. Yes, sir.

Q. Is that a fair statement of what you did?

A. Yes.

By the Court:

When you put your finger in there, what part of it did your thumb come in contact with?

The Witness:

Back here.

The Court:

Back of the chalk mark?

The Witness:

Yes; you can see it. That is the only part that you can reach.

The Court:
That is up by the chalk mark?

The Witness:
Yes; the seat is covered. We can take a great deal of chalk and mark it back on there, and then you can crush a ring right down.

(By Mr. Underwood):
Q. Mr. Gibbs, in your experience, where such a device is in the engine room of a vessel, is it customary to have one or two valves?
A. One; I have never seen two before.
Q. Now assuming that the line which led to these valves came out of the feed manifold at the starboard end of the feed manifold and turned back 180 degrees and ran to port, and that it was supported amidships by the sides of the tank; that it straddled the square hole in the bulkhead between the engine room and the tank compartment; that the valves you have before you were a few inches to port of that,—in your opinion was that line adequately supported against the weights involved?
A. You would have to tell me what the size of that line was before I could answer that question, also the approximate distance between—
Q. Assume that the line was of a size that appears in Libelants' Exhibit 2, which I believe is a quarter inch brass pipe.

Mr. Matteson:
Referring to the line that was attached to the drain valves? I don't know that it was that size?

Q. We will start all over again. What size pipe would you say it was that led into the valve marked Crane 150 on Libelants' Exhibit 11?

A. I think that is 3/8ths. I have got to get my own glasses. I can't see anything very well without them; but anybody can tell you that; that maybe half inch; I guess that is half-inch; I would say that is half-inch; yes, that is a half-inch pipe.

Q. Assume that the line that led to these drawoff valves was half inch pipe, that it led from the starboard end of the feed manifold a distance of about six feet athwartships to a point where it passed through and was supported by the two upright sides of the tank, can you tell me whether or not in your opinion that was adequate support to hold that pipe against vibration or leakage?

A. If there was as much as one support about approximately the middle that was more than adequate.

Q. Something has been said about the union between these two drain valves being inserted the wrong way. What is your opinion as to that?

A. I have never heard of a union having a right and a wrong way.

Q. If there is a claim of leakage inside of that line, is the pressure affected more by its moving in one direction than in the other?

A. Not that I know of. You might get some theory of certain projectile equations of current and so forth, but as a practical matter I would say absolutely not.

Q. Now specifically about the angle of the ground seat and the plug of the ground seat valve in Exhibit 11; is there anything wrong about the angle; would an angle flatter or finer be better?

A. No.

Q. Would it make any difference?

A. No. The only effect, with these pressures involved, the angle would have would be to increase its efficiency as a throttling contrivance. In other words, you have an opening of 1/32 of an inch, and with a very sharp angle you could turn this more distance and only slightly increase the opening, whereas, if you had a perfectly flat

seat it would be the other extreme, and to open it the least bit you would practically give it an upright flow, and you would either have your valve running wide open or shut entirely; so a taper is given for two reasons; one, it tends to center itself and to make a wedge-fit, and the other is it increases the throttling; whether it is a fine taper or a flat taper is purely a matter of how much you want to throttle your valves.

Q. Has it anything to do with the tightness?

A. Certainly not in the realm of anything up to 100 pounds or 150 pounds.

Q. Do you understand that there was in the Seminole a glass gauge by which to tell the quantity of gasoline in the tanks?

A. Yes, I understand that there was such a thing.

Q. You have not seen it, of course, because you have not been there since the fire.

A. All right.

Q. Assuming that there was a glass gauge that ran from the feed manifold approximately to the head of the tanks, can you tell me whether or not in your opinion such a device is proper or improper?

A. I think that that is the proper thing, and if properly protected it is one of the most accurate things, and I think that as of that day the only thing that was accurate at all. There are complicated things where you pump air in them to get the pressure head of gasoline, but when you are dealing with such small heads there is not much accuracy in these machines, and it takes a long time to get a reading.

Q. From your experience is that method of telling the amount of gasoline in tanks the customary method?

A. I have seen it done. As a rule, they don't have their tanks right there where it is easy to get at them. This is the method that would suggest itself. Most tanks are covered up, and joiner work is beneath floors—this is a method that would suggest itself; in this way you have a

daily reading on the tanks and it is practically in front of your eyes.

Q. Is there any fire hazard involved in that fitting, if the glass doesn't break?

A. No; you have them on every boiler, steam boiler.

Q. How high pressure do they sometimes use such fittings?

A. They go as high as 330 pounds; 330 pounds—300 pounds.

The Court:

We will stop now.

(Adjournment taken to 9:15 A. M., Nov. 15, 1939—the following day.)

Wednesday, November 15, 1939.
9:37 o'clock A. M.

3629 Hearing was resumed pursuant to adjournment of the previous day; and thereupon the witness GEORGE W. GIBBS was recalled and further testified as follows upon continued direct examination.

By Mr. Underwood:

Q. Mr. Gibbs, in your opinion which would be the better practice in carrying gasoline for use in priming the motors of the Seminole; carrying it in a squirt can that had to be refilled from the gasoline supply system, or to carry it in such a can as this, Libelants' Exhibit 137, I think it is?

A. Well it would be impractical to fill directly from that can, at all, and I would therefore think that it would be a safer thing to get a device which would safely and quickly fill a squirt can. Those things are primed with squirt cans invariably.

Q. Could you fill the priming cup from that instrument, directly?

A. It could be done, but it wouldn't be practical to do it, without spilling a good deal of gasoline.

Q. Will you compare the size of the nozzle of the can with the aperture of the priming cup?

A. Yes, sir; if you lifted that up, these hangers are very high, and if you held this up it would be hard,—and tried to put that over in there, it would,—you would most likely in lifting this heavy thing, being no throttle on it, you most likely would overflow it and flash all over the engine. With the squirt can you can mete a drop at a time, or a small amount; and furthermore, with a squirt can, you know how many squirts to put in the engine where your engine starts best.

Q. Now what kind of a valve does this can have in it?

A. I don't know.

Q. Will you open it up and look?

(Witness removes valve from can.)

A. That is a plug valve.

Q. Is that what is called a rotary valve?

A. No,—it might be called a rotary valve; you rotate it to make the connection; rather, in order to open it or shut it. There apparently is an orifice from here into the body of the tank, which registers with this; and this appears to be a ground joint, and there is a spring there. That undoubtedly is used to hold it down tight and prevent leakage.

Q. What can you say about the flexible length of hose there; is that a satisfactory arrangement?

A. Well our experience with that has been that it is when it is new, but that it isn't a permanent thing at all. It is made out of thin sheets that are formed in that shape; it is like the others I have seen; it has a soft packing of

asbestos or something of the kind,—it is a combination of a fibre and a metal, and usually they break right in here. A thing that isn't flexible at all as a rule, you don't attempt to bend it; where you have something that is flexible, you depend upon the flexibility, and you reach it, and you grab it, and you would have a tendency to top that right here.

Q. Are they satisfactory so far as leakage is concerned, over a period of time?

A. No.

Q. Now Mr. Gibbs, in your opinion is it reasonably necessary to have a shut-off valve in the gasoline feed line at the carburetors, when you also have one, as in the Seminole, just below the feed manifold?

A. That is largely a question of taste, or the wishes of the operator. I myself prefer one valve to do one job. One might think that one valve is shut, so he wouldn't have to shut the other; but where there is one definite valve to shut; it would be more definitely used.

Q. Assuming in the case of the Seminole there was in each feed line, just below the traps, which in turn were just below the manifold, a stop valve, in your opinion was it reasonably necessary to have another stop valve in the feed line at the carburetors?

A. No.

Q. What in your experience has been the purpose of having another stop valve at the carburetors, in installations where that is the case?

A. Well you put the stop valve at the carburetor, it is usually a little nearer to the engineer; he can shut it off without walking back, a very short distance he would have to get at that valve?

Q. Is there any fire or explosion hazard in not having such a stop valve at the carburetor?

A. No.

Q. And when, as in the case of the Seminole, the stop valves below the traps, which is below the manifold, were

shut, was there any substantial head of gasoline in the carburetors?

A. No.

Q. In your opinion, was it necessary to have drip pans under the carburetors on the Seminole?

A. Drip pans have certain advantages, but the construction of those carburetors, where the intake came out of a clutch housing, I would not say that it was necessary.

Q. What is the ordinary capacity of a drip pan under a carburetor?

A. They usually are about fourteen inches by five, by five-eighths, in size.

Q. What is the depth?

A. Five-eighths.

Q. And do they serve any purpose whatever if there is no leak in the carburetors?

A. Where you haven't got a manifolded—where there is no leak in the carburetor? They would serve none, where there is no leak in the carburetor,—no leak anywhere else.

[Q.]A. Do back-fire arrestors serve any purpose so far as fire and explosion is concerned, except when the motors are running?

A. No.

Q. Mr. Gibbs do you understand that the feed line,—gasoline feed line system was made up of brass pipes and fittings, from the tanks?

A. Yes, sir.

Q. To the main motors?

A. Yes.

Q. In your opinion is that a satisfactory, sufficient arrangement?

A. Yes.

Q. Something has been said in this case about the use of copper tubing. In your opinion, does either have any marked superiority over the other?

A. I think the brass pipe has a marked superiority over copper.

Q. And what are your reasons for that?

A. It is harder, more susceptible to what I would call a practical joint. A thread cut in copper is not a good thread, you can twist it off or mar it. The brass pipe makes practical fittings, universally used. The thin copper of course which is used for this purpose, cannot be used with a thread, without some form of adapter. The copper tubing is used largely in the interest of cheapness; stock boats and boats that are originally planned and constructed; but not, as a rule, in converted boats; it is a very difficult thing to take a copper tube and run it around other obstructions that exist in the boat at the time of the installation of the new machinery. Copper mashes when you try to bend it, it becomes flat; and when it becomes flat, it restricts any little sediment or dirt that might come through. The operator will try to relieve that restriction, he will step on the tube, be might drop a wrench on the tube, and he tries to make the tube again round, where it has been flattened or dented, and that is a very dangerous thing to do, to a thin tube.

Q. Which is stronger, brass pipe such as in the Seminole, or the ordinary copper tubing that is sometimes used?

A. Brass pipe.

Q. And can you get a satisfactorily tight joint in brass pipe fittings?

A. Certainly.

Q. In your opinion, which is the better for use on such a vessel as the Seminole?

A. Screw-type fittings, such as were used in the Seminole, in my opinion are better than such fittings as are normally used in copper tubing.

Q. Does the possibility of injury from vibration have any bearing upon which is preferable,—brass pipe or copper tubing?

A. I would not say that the copper tubing would lend itself,—that there is any advantage in the use of copper tubing; for the reason that copper tubing, you can usually go over great distances without separating. You have a long thing which has a tendency to vibrate. In installations of copper tubing we often provide for the joining two points, for instance, the tanks and the carburetor, and then you use this rather flexible thing, to lay where it will, reeve it inside and out, in making your turns, by bending the tube. And as a that job isn't as securely fastened as where you take the rigid, heavy pipe and make your turns with L's and fittings.

Q. Is br ss pipe any more susceptible to damage by vibration, than copper tubing?

A. No.

Q. Assuming that vibration has an effect on brass pipe, to loosen up fittings, would you anticipate any such loosening during a period when the vessel was laid up, in storage, and motors not running?

A. No.

Q. Could you tell from your examination of the Seminole's gasoline feed system, whether the joints were tinned or soldered?

A. No.

Q. And why not?

A. Either solder or tin has a very low melting point, and the presence of any heat,—appreciable heat, would melt it off.

Q. Is it necessary in brass pipe installations such as on the Seminole, to provide coils to absorb vibration?

A. I have seldom seen them in connection with copper pipe installations.

Q. You mean, brass pipes?

A. I mean, with brass pipe installations.

Q. How long has copper tubing been in use, in your experience?

A. May I go back to that other question?

Q. Certainly.

A. The only place there are coils being put in engines with all classes of piping now, where the engine is mounted in rubber, and where the entire engine shakes, and floats,—such as a Plymouth floating power there is some confusion as to the presence of a coil; that is not due to any vibration in the pipe line, or in the ship; but you have a fixed point, and an engine that is joined to it; and the engine moves, and the distance between the engine and that fixed point varies; therefore taken up in coils.

Q. That is because of the movement of the motor itself on its rubber seat?

A. The motor itself. It has nothing to do with the normal alleged vibrations of the ship; and we could name a great many instances of modern installations where rubber is being used, in what you call floating engines, or floating power. But aside from that, very seldom that the coil has ever been used with brass pipe. However it has been used with copper tubing, due to the fact, as I have previously stated, that copper tubing is more a connection between one point and another; more like a line, a piece of wire, and very, very flexible. The other is more of a rigid, fixed installation.

Q. Well how long has copper tubing been available for general use?

A. Well there is nothing particularly new about it; it has been available for many—before I was born; a great many years. The fittings, there are modern fittings that have brought it into a little more general use, that is, more practical to be used by an amatuer. In recent years it has come into greater uses because of the fittings an amatuer can use, than it was in the past, when it called for either brazing or soldering. Its use is very likely with stock boat job, where cheapness is the prime factor.

Q. Well which is more expensive, brass pipe—

A. Brass pipe is much more expensive.

Q. And which is more expensive so far as the labor cost of installation is concerned?

A. Brass pipe is much more expensive.

Q. Did you observe the holes in the bulkhead between the engine room and the tank compartment from which the filler lines ran?

A. Yes, sir.

Q. And through which the lines to the feed manifold ran?

A. Yes, sir.

Q. The square opening below?

A. Yes, sir.

Q. And the spaces around the tanks?

A. Yes.

Q. And at either end?

A. Yes, sir.

Q. Between the pans and the bulkhead?

A. Yes.

Q. Taking those apertures into consideration, in your opinion was that tank compartment adequately ventilated?

A. It was well ventilated.

Q. Then what is your view as to the need for ventilation in such compartments?

A. Well there was certainly no necessity for the degree of ventilation that existed there. There is no objection to it. The only need for ventilation was to probably prevent dry rot of the wooden bracing members that were inside.

Q. Well in your experience Mr. Gibbs, in the design and construction of ships which are propelled by gasoline motors, is provision for ventilation made in view of potential leakage in the gasoline system?

A. No.

Q. What are the purposes for ventilation?

Mr. Matteson:

Excuse me, may I have the last question?

(The preceding question was read by the reporter.)

(By Mr. Underwood):

Q. What are the purposes for providing ventilation?

A. Primarily in order that people in the vessel could live and breathe. Other reasons are the providing of air for the motors;—the gasoline engines, internal combustion or steam engines; boilers; air is required wherever combustion exists. Also for the comfort and for the preservation of cargoes. Without ventilation you would have great heat,—or uncomfortable heat, and destruction of cargoes of perishable nature. The ventilators as are normally known are not provided with a view to saving a ship in the event of gasoline leaks.

Q. Well now would there be, in your opinion, any circulation of air in this tank compartment, having in mind the apertures that I described to you a moment ago?

A. Yes, they have; and very small ones, quite large enough, high, and there were larger holes low, in this tank compartment; and wherever there is a difference in temperature there is a movement of the,—whatever the gas was whether it was air, which is a combination of gases, or whether it was a vapor of any kind.

Q. Well now turning to the engine room, do you have in mind the two cowl ventilators, and the skylight, the engine room hatch, the window on the starboard side of the alleyway, the window on the port side through the hull of the vessel, and the window in the engineer's room: In your opinion, was that adequate ventilation?

A. Quite.

Q. And what would be the effect of ventilation, natural ventilation, through those sources?

Mr. Botts:

I object, on the ground that this witness is not qualified as an expert along those lines.

The Court:

I think that goes to the quality of the answer. I overrule the objection.

A. Will you read the question?

(The question was read by the reporter.)

A. The effect would be to completely relieve that engine room of all gases that might exist in it; whether it be nitrogen and oxygen, the principal component parts of air; or any other gas.

Q. Do you understand that the cowl ventilators extended only a few inches below the raised trunk of the engine room, and did not extend into the bilge?

A. Yes.

Q. In your opinion was it necessary, to obtain adequate ventilation of the bilge, to have ventilators run down into the bilge?

A. No.

Q. Why is that?

A. For this reason; such ventilators would have tended in no way to bring about a more rapid discharge of the gases. In mentioning gases, I mean not necessarily gasoline fumes, I mean such gases as compose the air, and that might be in the engine room; but gases, not liquids or solids.

Q. Well, in gases, do you include gasoline vapor?

A. As a gas.

Q. Have you made any experiments to satisfy yourself on that point?

A. I have.

Q. Will you describe that to us?

A. I have taken a container,—two containers of like size; deep pots, and have put known quantities of gasoline in those pots. I have put in one of them, ventilators extending to within one-half diameter of the surface of

the liquid; that is the pot where the draft enters. The other, one diameter from the surface of the liquid. One ventilator faced the air,—the current of air; the other ventilator was against the current of air, tending to cause a vacuum in that ventilator. I have observed the flow of air through the intake ventilators, to a point where a very distinct and continuous ripple occurred on the surface of the raw gasoline. The gasoline evaporated faster in the copper pot without the ventilators, than it did with the copper pot with the ventilators.

Q. When you performed that experiment with the two vessels holding gasoline, how far apart were they?

A. Side by side; eight inches apart.

Q. And were they equally close, or not, to the source of the breeze?

A. It was in a tunnel, or rather in a hall, in which there was a stiff breeze such as the breeze that you have today; and at one time it blew a note book off of the shelf. There was free opening.

Q. Were the two vessels of equal size?

A. Of exactly the same size.

Q. Did they have the same quantity of gasoline?

A. Exactly the same quantity.

Q. Which one evaporated faster?

A. The one without the ventilators.

Q. Those ventilators that you speak of, in what shape were they?

A. They were made of the general shape of the cowl ventilator; they were made up of pipe, which we had a street L,—rather a straight L; and to them was screwed two pieces of three-eighths inch pipe. Of course the opening of the air was much larger than the size of the pipe,—quarter inch pipe,—three-eighths; and the two containers were two ordinary drinking glasses; identical drinking glasses.

Q. Now in your experience Mr. Gibbs, in the design and construction of vessels propelled by gasoline motors,

is it customary for the architect or anybody else to sit down and assume an amount of leakage of gasoline and provide ventilation for the removal of the vapors?

A. No.

Q. Is that factor taken into consideration?

A. No.

Q. If you were considering provision for ventilation to care for possible leaks in a gasoline line, what factors would you consider?

A. I would want a provision for a cross-draft, above all forms of ventilation.—Will you read the question again?

Mr. Underwood:

Mr. Bryant, will you read the question?

(The question was read by the reporter.)

A. I would like to have my whole answer withdrawn.

The Court:

You don't think your answer is in response to the question?

A. I didn't understand what the question was.

The Court:

It will remain in the record, but it will remain with your comment. Now you may proceed.

A. Now will you read the question to me?

(The question was re-read by the reporter.)

A. I would consider the close connection of the gasoline lines to cross-drafts, such as windows. The primary factor that would be foremost in my mind would be taking advantage of convection. I am convinced that the most effective method of ventilating a ship is by means

of large openings high in the ship which enable cross-drafts. I have previously described an experiment which I made. Contrary to what one would suspect, the vessel with no assistance towards ventilation was a more thoroughly ventilated vessel than the vessel containing artificial assistance to ventilation. This experiment has convinced me that natural ventilation, which will occur in an engine room by the finest number of baffles,—in the presence of cross-drafts, is ideal ventilation.

Q. Mr. Gibbs if you were asked to provide ventilation to remove gasoline vapors from the engine room of the Seminole, would you have to know, or would you not have to know, the quantity of gasoline vapors that you were going to have to remove? In other words, does the amount of ventilation to remove gasoline vapors, depend upon the quantity of the vapor?

A. It does; and the time in which you have to remove it.

Q. Well suppose the—assume that the gasoline system of the Seminole leaked gasoline at the rate of a teaspoonful a day; would the natural ventilation through the sources that we have discussed, carry away such vapor?

A. In my opinion, unquestionably.

Q. Well suppose you spilled the contents of a 55 gallon drum of gasoline in the engine room, would natural ventilation carry away the vapor from that?

A. Unquestionably, in time.

Q. Can you give me any idea as to how long that time might be, or what does that depend upon?

A. It would depend upon the cross-draft.

Q. Does it depend upon how fast the wind blows?

A. To some extent.

Q. Does it depend in any measure upon the change of temperature over the day and the night?

A. Exactly, the length of the day, summer or winter, with long days or short days; or, the moisture in the air,—the humidity.

Q. Now you have spoken of convection; will you tell us how this convection operates, with particular reference to an engine room such as the Seminole?

A. Convection refers to the movement of gases as the result of the specific gravity of the gases or weight per unit volume; or, by difference in temperature of the gases. Practically wherever gases exist, there is continuous and violent movement. Where this continuous and violent movement exists, it is only necesasry to take time, with a cross-draft, to sweep them from the vessel; whereas you might have a certain gas in one section of that vessel, if movement is continuous and universal, that gas must reach the place where it is affected by the cross-draft. Therefore the cross-draft is the essential thing for the removal of a gas from a container,—engine room, or bottles. There would be only one way to hold a gas in a bottle, that is by the application of a tight stopper.

Q. Well now, assume you have got a quantity of gasoline vapor in the bilge of the Seminole, laid up under a shed, such as you have described; what would be the effect of convection on such gas vapor?

A. Will you repeat the question?

(The question was read by the reporter.)

A. With a quantity of gas vapor in the engine room—

Q. Or, the bilge?

A. Or, the bilge. Convection would cause all gas, wherever it exists, where it is free to move, to move to a position where it would mix with the incoming and outgoing air in the boat. Even where there would be no wind, convection would cause a general intermingling of the gas inside of the engine room, and when the inside gas gets hotter than the outside air, the expansion of that gas would cause some portion of that gas to leave the engine room. Where the temperature of that gas inside of that engine room was colder than the air,—than it had

been previously, it would contract and cause the air to enter the room through whatever opening there happened to be. And that new air would mingle with the gas within the engine room, and when expansion set in, by the difference in temperature, and increase in temperature of the engine room, then there would be pushed out of those orifices the gasoline or vapor, plus even some of the air that had been just recently brought into the engine room, and that would go out. However, the cross-drafts, or the convection currents, which not only exist in the engine room but at all places where there is an atmosphere, would cause drafts to hold the process back, much more violent than the processes due merely by the expansion and contraction of the gases in the engine room.

Q. Assuming you have spilled a quantity of gasoline, we will assume a quart, and to begins to evaporate and forms a gasoline vapor; do you know whether that vapor remains static, or whether it in turn continues to dilute?

A. It continues to dilute.

Q. To what extent?

A. To an extent dependent upon the laws of convection, and the—that is the answer.

Q. What becomes of it finally?

A. It finally is dissipated into all sections of the atmosphere.

Q. Does it remain as a gasoline vapor at all?

A. No. It may reach a cold place and under certain conditions become a gasoline again.

Q. You mean it could be precipitated again?

A. Oh, yes.

Q. By becoming colder?

A. When it goes below its point of saturation, or dew point, and hasn't already mixed with—become so diluted with other gases, which of course it probably would.

Q. Do you understand that the switchboard of the Seminole was made up of open knife switches?

A. Yes, sir.

Q. In your opinion are they proper switches for a vessel propelled by gasoline motors?

A. Yes. That opinion is based on the fact that it is practically universal practice, or was at the time; no switches known to me that were as good, as of that date.

Q. Are they in common use today in such installations?

A. Yes.

Q. In your opinion, is it proper to have the main switchboard composed of such switches in the engine room itself?

A. Yes.

Q. In closing,—in your experience in closing such switches where the voltage in 110, is there any spark?

A. No.

Q. When do you get a spark on such knife switches, if you ever do?

A. You get a spark when you broke a switch, if at all. It would be only—if you had a current which would tend to burn the carbon, gasify it, and leave it as a gaseous conductor, it would become brilliant in the burning, and there a thing that was very minute would affect the nerves of the eye in a way that would look like a very violent spark.

Q. How big a spark do you get when you open such a switch, ordinarily?

A. Well a good clean switch, it is usually visible to the eye,—usually isn't, but I have seen them.

Q. How big is it?

A. It is extremely small, with 110 volts.

Q. Compared to a pencil or a pen?

A. I would say about the head of a pin, would be a large spark.

Q. What becomes of it when you close the switch,—that kind of a spark?

A. When you open the switch?

Q. No, when you close the switch. As I understand it, you don't ordinarily have a spark when you close such a switch; is that correct?

A. That is correct.

Q. When you do get such a spark, as when you open a switch, does the spark last long enough to go any place, or does it stay there, or what becomes of it?

A. It is almost instantaneous; it isn't nearly as long in duration of time as it appears. The persistence of vision is a factor. I have never known of a measurement of that; it would be almost measuring the speed of electricity.

Q. It is as fast as that?

A. Quit as fast, and then some.

Q. Have you had any experience in getting vessels ready to be laid up for a time,—vessels propelled by gasoline?

A. Yes.

Q. In your experience, it is necessary to remove the gasoline from the gasoline tanks?

A. No.

Q. And is it customary in these waters to do that?

A. It is sometimes done that way, and sometimes done other ways.

Q. What is the reason for your opinion that it is not necessary?

A. There are many catastrophes that can happen to plants in Florida, where they are subject to hurricanes and fires. On the same principle that you take your automobile to a storage lot or garage, and you don't take the key with you; you give the operators the full chance to maneuver your automobile out of danger. And there is considerable advantage in having it in ships, so that she can be taken out of danger, and quickly. We have done it both ways. The time of lay-up has a good deal to do with it. If the boat is to be laid up for several years, or indefinitely, a good thing to do is to take the engines

heads off and cover the parts with vaseline, in order that the parts don't become what you call frozen, or rusted.

Q. Assuming that the Seminole was to be laid up for a period of months, in your opinion would it be necessary or required to remove all the gasoline from the tanks?

A. No. We have such a yacht into storage now, and they are requiring us to turn the engines over at periods, to avoid the necessity of what it known as this freezing process, or any rusting that might get under those valves, by the mere presence of atmosphere.

Q. Does the fact that the Seminole had batteries which had to be charged from time to time, have any bearing on this point?

A. As I say, that is more or less a personal equation. If you wanted your batteries charged, of course you should have had gasoline, some gasoline in the boat; at least I would have wanted it. I don't know whether there was any there or not.

Q. Now assuming that the Seminole had been laid up for a period of two months, under a shed, and that June 24th, 1935 two men went aboard, passed through the alleyway from the after deck, forward to the engine room, and that one of them entered the engine room through the alleyway window and walked back to the switchboard, and that there was no odor of gasoline; is there any reason why he should not have closed the switch on the switchboard?

A. None whatever.

Q. Why do you say that?

A. For the simple reason that that switch was made for service, to begin with. The modern houseboat, or houseboat of that day, the day that she left the shipyard, used equipment available which made it a usable piece of apparatus.

Q. Now assuming that—

A. And the owner's representative certainly had the right to believe that it was a normal piece of machinery.

Q. Assuming that the Seminole had been in operation up to the 15th of April, and was laid up on the 15th or 16th of April and that during that period of operation no leaks had developed or were apparent in the gasoline system, anywhere; and then two months later, approximately, during which she had [illegible] laid up under this shed, this man went aboard and went into the engine room and threw these switches to get light; in your opinion, should he anticipate the presence of gasoline vapor?

A. No.

Q. Why do you say that?

A. Well because, with considerable experience of many years, I have seen and known men who have gone aboard vessels and done that very thing, just as they would go into their house that they hadn't been into for a long time, and strike a match, even in the kitchen, where the gas it quite as dangerous as any gasoline fumes, exists; strike a match or put on a switch which might start up the electric refrigerator, which would be the same thing. I do not believe a man could be expected to assume that there is a defective situation, under those conditions. I also know, in my experience in this line of business, of almost no case where a boat has ever caught fire in the midst of a lay-up due to any gasoline fires. I have made investigations with people who have operated many, many boats, such as government agencies, the Navy and the Coastguard, to find that nearly every fire ever known to exist as the result of a gasoline explosion, has been at the time of the filling of the gasoline tank, or, when a boat is in service: Practically never at a time when she is laid up.

Q. Now Mr. Gibbs, if you don't have any leaks in operation, is it reasonable to expect any leaks when she is laid up and not being operated?

A. Certainly not.

Q. Now turning to another subject, I show you Libelants' Exhibit 97, the so-called regulations governing marine fire hazards, put out by the National Fire Protection Association. Are you familar with those rules?

A. I don't know what they are, sir; I can't tell you. I familiar with most accepted practices in the construction and repair of boats.

Q. Well, do those rules represent an accepted practice in ship-building and ship keeping down here?

A. I haven't read them. I may have read them somewhere else.

Q. In your experience in the construction and repair of ships, are those in common use down here?

A. Not that I know of. A great many of the people that have yards today,—men that work in them, work in our yard; I don't think that I have ever been in a shipyard in Florida that I haven't had men that were trained in our yard, which has been in existence almost twenty-eight years.

Q. Have you ever used those rules as a standard of practice?

A. No. I may have used something that may be in this book, but I have no knowledge that the causes that actually did our work, is embodied in this book.

Q. You mean you may have done some of the things that are suggested in that book, but not because the book said so?

A. Well I haven't seen the book so I don't know.

Q. You can't say. Now I show you Libelants' Exhibit 24, which is called Regulations for the Prevention of Explosion and fire on Motor Boats, by the Bureau for the Prevention of Explosion and Fire on Motor Boats. Did you ever hear of those before this case came on?

A. No.

Q. Have you ever used those as a standard of practice in your work?

A. No.

Q. Do you know of anybody else who has?

A. No.

Q. Now I show you Libelants' Exhibits 101 and 101-A: Lloyds Rules and Regulations for the Construction and Classification of Yachts. Have you ever used those as a standard of practice in the construction and repair of any vessels?

A. Only where an owner would specifically want his stuff done according to those rules, would we do it. I think we have possibly done that; that is, have taken sections of those that the owner wanted done in accordance with Lloyds; and I have understood at the time that he wanted to take out insurance, where the job should be done in accordance with Lloyds specifications.

Q. Are they a commonly accepted standard of practice down here?

A. It is practically never that we have referred to them or have been asked to.

Q. Did you observe from your examination of the Seminole, the condition of the wooden timbers in the floor of the engine room?

A. Yes.

Q. What did you find that condition to be?

A. They would indicate that there was not much heat down in the lower part of the ship; because wood acts—

Q. First let's get the condition as you observed it, of the wooden members, the foundations of the engine and the stringers across the ship, and so on.

A. Well the wood was intact.

Q. Was it burned up?

A. Not that there was any quantity of it. Of course there were charred pieces, there were cinders; where they came from I don't know.

Q. Did you observe the wooden supports on which the tanks rested?

A. Yes, sir.

Q. Were they consumed or affected by fire?

A. No. You mean by that, those pads that go underneath the tanks?

Q. The 4 x 4's, if that was their size, on which the tanks themselves sat?

A. Yes.

Q. Were they burned at all?

A. Not that I know.

Q. Are you able to form any opinion, from the condition of those wooden pieces, as to the extent of fire in the bilge?

A. Those things, the wood which burns readily, and which did burn in the—for instance in that tank compartment the charring seemed to be the result of intense heat in the higher portion of the ship. You could see a stanchion, the top burned off and the bottom in perfect condition.

Q. How about in the bilge of the engine room?

A. In the bilges in the engine room, would indicate to me that there was no fire down there: in fact I am almost certain that there was no fire in the bilges.

Q. Assuming that the tanks, gasoline tanks of the Seminole, were partially filled with gasoline when the fire occurred on June 24, 1935, what would be the tendency of the heat to which those tanks were subjected, as to its effect upon the gasoline in the tanks?

A. The heat would tend to vaporize that gasoline and send it through the openings—

Q. You mean, the vents?

A. The vents.

Q. Assuming that the tanks were, say, less than half full of gasoline, after such a fire of three or four hours' duration, would you expect to find any gasoline there at all?

A. No, if it lasted three or four hours I would not.

Q. From your examination of the Seminole did you see any evidence of a violent explosion?

A. No I didn't. I have seen explosions.

Q. Did you find any structural plates that were ripped or torn apart?

A. Not as you would see in an explosion. I found tears, but they would be accounted for; one particular tear, by the wrecking crane that picked up the top of the house.

Q. Did you observe the condition of the bulkhead between the engine room and the alleyway?

A. Yes.

Q. And how do you account for that?

A. Well if the roof were fastened to that bulkhead, and if that bulkhead,—if that roof fell, in the general debris it would have bent that—if it was anything like that, and the roof was up here, it would have bent the top in, and then when the wrecker came and lifted the roof, it would have bent it back at the place,—at the deck line.

Q. In order to shorten this, can this condition be accounted for by heat during the fire, or the removal of the steel deck head, as well as by explosion?

A. Of course the heat, all of those parts were possibly red and soft; the heat would have had very much to do with the appearance, because they were quite soft.

Q. Did you notice any substantial distortion of the after bulkhead of the engine room?

A. No.

Mr. Underwoood:

That is all.

(Brief informal recess was had.)

Cross Examination.

By Mr. Matteson:

Q. Mr. Gibbs, at the very first, the vent pipe that was used to vent the gasoline tanks on the Seminole,

which I think was half-inch pipe, I think you said that that would offer very little resistance to the flow of air through it?

A. Yes.

Q. And the fact there is little friction involved in the passage of air through a pipe; is that correct?

A. Yes, sir.

Q. So that with a half inch vent you should have a ready and quick adjustment for variations of temperature between the tank and the atmosphere; is that correct?

A. Due to the variations of temperature—yes, sir.

Q. You don't subscribe to the theory then, that a vent pipe of that size would restrict the passage of air from the atmosphere to the tanks, or vice versa?

A. Yes, the smaller the pipe, the greater the restriction to the passage of—to the interchange of air from the tank to the atmosphere, due to convection.

Q. Well, I gather from what you said that any restriction would be negligible.

A. No; the restriction in the positive pressure of the piston, gasoline piston, we will call it,—the displacement of the air by the filling with gasoline, the restriction under those comparatively high pressures would be negligible in that size of pipe. That size of pipe, however, would be of an appreciable size when it came to the slow interchange of air from the tank to the atmosphere, due to the convection of currents.

Q. You agree that there is practically no friction to the ingress and egress of air afforded by that pipe?

A. At those velocities yes, sir.

Q. Or, at any velocity?

A. Any velocities considered, no, sir; at very high velocities the friction becomes quite great.

Q. At low velocities it would be negligible?

A. Yes, sir.

Q. And any velocities—

A. That we are considering.

Q. Any velocities arising out of gradual changes in temperature, would be very low?

A. That's right, sir.

Q. And in such case the resistance to the passage of air, would be negligible?

A. Yes, sir.

Q. Are you familiar with Kent's Mechanical Engineers' Handbook?

A. I know what it is.

Q. Do you regard that as a standard work?

A. I regard that is a very excellent note book. I don't subscribe to everything that is in it; but there is much in it that serves as a good guide to an engineer.

Q. It is recognized as a standard work on the subject, is it not?

A. Oh, yes; he is recognized for exactly what I have just stated.

Q. And you don't know of any other work that is better, on the subject, do you?

A. Well I know of many articles that are written by engineers, as those articles are written, that are more to be relied upon than the articles in that book.

Q. On special subjects?

A. Well on the subject of general engineering; the modern—I mean new discoveries and applications that apply to general principles. As a matter of fact the book is made up of such research, and it is a very good book; very good guide.

Q. Now with respect to the subject of ventilation in a gasoline boat, you have given us certain views with respect to it. Have you ever written any articles or published any books or discussions with respect to the subject of ventilation of gasoline vessels?

A. I have not.

Q. Can you refer us to any standard works that support your views with respect to the necessity of ventilation in a gasoline vessel?

A. Well I could refer you to the trade journals I keep up with, and the articles there are based on practical experience, and written as a rule by architects and engineers that I regard of great capacity. I have employed a great many architects, who have discussed those things with me, and I have—could refer you to a number of those magazines, those trade journals, as the source of much of the information that I have got. Of course as a student at the Georgia School of Technology, we had a thorough course in ventilation, and in the internal combustion engines, and all fundamental laws that affect it; design and operation.

Q. First of all, the trade journals that you refer to, what trade journals do you refer to?

A. I refer to Motor Boat, Motor Boating, or any of the current journals. I could not tell you that I read an article on ventilation in Motor Boat, it might have been in Motor Boating, it might have in the Rudder, or it might have been in Diesel Progress, Pacific Motor Boat; but those various technical journals, I read; it might have been even in some civil engineering journal, that often takes up those discussions.

Q. Now can you refer us to any particular articles that have appeared in these journals, that are the source of your views?

A. No.

Q. Or, that support your views?

A. No, I don't know that I could refer you to any article specifically on those subjects, that I read monthly, —as to the date and the name of it. I could refer you to some articles written by Mr. Taylor in Ships Lines; but I don't know the month or the magazine that it came in, except it was a technical magazine.

Q. Of course we are not particularly interested in Ships Lines here. Can you refer us to any articles relating to ventilation of motor driven vessels?

A. Perhaps if you would tell me what phase of that, I might be able to recall some person who has written on the subject.

Q. Well, any phase of ventilation in a gasoline driven motor vessel?

A. Well, I can recall one article, was once read on ventilation through a fan, a Sirocco fan, to be built in the fly-wheel. I regard that article as of no particular value, but it had in interesting study. The man who wrote it I don't know.

Q. And where did that article appear?

A. In some one of these trade journals.

Q. You spoke of the name of one of these trade journals, and at one time I understood you to say Motor Boat, and the other, Motor Boating. Are they two magazines, or are they the same one?

A. They are two different magazines.

Q. And do you include them both in the trade publications that you refer to?

A. Yes. The articles in them are usually written by naval architects, some of them by engineers; the most enlightening articles I have read in sometime, by a Mr. Max Angas, Captain in the Navy, in Motor Boating.

Q. And you regard Motor Boating as a reputable, reliable trade paper, do you?

A. Well, I do regard it as a very valuable paper. I don't subcribe to all articles written in the paper; but I regard it as a source of valuable information.

Q. And why would you pay any particular attention to an article in such a magazine? Is that because articles appearing there are selected by competent editorial staffs for publication?

A. Well I would pay attention to them, because nearly everybody, a great many people rather, connected with my profession, which is a small one, are men known to me; their backgrounds are known to me; their work is known to me; their successes are known to me, and their

failures are known to me. And I have myself an experience which would enable me to form some judgment as to the value of the articles. I particuarly am interested in these magazines, that might be called popular magazines, and not quite such technical, although I read them too as engineering; some of the papers from the Mechanical Society of Naval Architecture, or the American Society, at 41st Street, New York,—or several of those purely technical journals.

Mr. Underwood:

That is a reference to the American Society of Mechanical Engineers?

A. American Society of Mechanical Engineers; or the papers of the American Society of Marine Engineers and Naval Architects. I am particularly interested in these so-called popular magazines, because they carry as advertisements, the modern devices obtainable on the open market, such as ventilators, and ventilating devices, with discussions of the valves of those devices, by their own engineers; and I consider the source of such information as more up to date, out of those places, than you would get out of papers and discussions from the engineering societies; which are usually discussed quite sometime after they are put in practical use.

Q. You would regard an article appearing in Motor Boating, for instance, as prima facie entitled to weight, would you not?

A. Absolutely not. I would have to know who wrote it. It might be a good article, and I might not read it, might not know the man,—it might not attract me. But motor boating, as those popular magazines, are quite apt to write articles on spectacular things, like submarine battleships, and things of that kind. But one of the most valuable articles that appear in those magazines, are discussions of new devices that are in the magazines, written

by the manufacturers of the devices, on the engineering part of it.

Q. Do you find that a magazine such as Motor Boating, we will say, publishes unreliable articles?

A. Oh, I think it publishes many articles of impractical things. I won't say particularly, Motor Boating, but I think all of those popular magazines do. You see them this month, and you never see them again; but they are interesting at the time.

Q. Now I want to get back to my first question. Can you refer us to any specific article in any of these trade papers, having to do with ventilation of gasoline driven vessels?

A. Not from my memory. I could go over my files and look up things that I know about.

Q. Well I would be glad if you would do that for us, Mr. Gibbs.

A. Well I haven't even got them here.

Q. Could you obtain them by communicating with your office?

A. I might and I might not. We subscribe to the Rudder and the Motor Boating, and the Motor Boat; and there is another journal that we subscribe to. Sometimes we keep them, sometimes we don't. But I will say briefly, that my knowledge as an expert is the result of 28 years of application to my business. What I have learned has been by frequent visits to my fellow boat builders, to other yards, to the factories; DeLavergne Machine Works; the engineering departments of manufacturers for many classes of goods that our company has sold. These matters of discussion on ventilation are common with us, just as cancer would be common with a group of doctors. To tell you that I read a certain article entitled a certain thing, by a certain man, dealing with a certain thing,—I have read many such articles, but I don't recall at this time just what the article was. I regard myself as a trained engineer who has applied himself to his business;

and my source of information is the result of that application, and construction of considerable articles that have been successful.

Q. Are you through?

A. Yes, sir.

Q. Well now you have told us that, I think, in substance, before Mr. Gibbs.

A. Yes, sir.

Q. But it still does not get to the point that I have in mind. I want to know if there are any published articles, books, or any authorities to which we could refer, on the subject of ventilation of gasoline boats, that you can tell us about?

A. You mean a treatise on ventilation?

Q. A treatise,—whatever you want to call it?

A. Well I know of no book that I could recall by name, or authority on the subject of ventilation.

Q. Now you spoke of studying—

A. Except the general books, such as physics; a treatise on thermo-dynamics; and the fifty-four subjects, some of which bear direct on the principles controlling design of ventilation.

Q. Now Mr. Gibbs you spoke of studying ventilation at Georgia Tech; can you tell us what text books you used there on the subject of ventilation?

A. By name I probably could not. I can tell you there are fifty-four subjects, and I can tell you what all of them had in them. But the name of the professor, or the man who wrote them, I couldn't give you instructions to wire and get a book. But there were some fifty-four different subjects,—even articles in French, on ventilation, that I have read; the ventilation of trains, in Paris,—or rather, in France.

Q. Well we are interested to get as much light on this subject as can. We appreciate your experience, and all, but we would like to know what authorities there are in this field that we can refer to, aside from Georgia Tech.

that you can't remember the text books you used there. What text books are there on the subject of ventilation for gases?

A. All right, sir, I will refer you to a book which you can get very quickly right in Miami,—the Encyclopedia. Look up the question of convection. You will there learn that all gases—

Q. I don't need you to tell us what we will learn there?

A. You will see it is fully discussed, and the explanation to such facts as I have expounded,—in that one paragraph; the cause and theories.

Q. You refer to the Encyclopedia Britannica, on the subject of convection?

A. The encyclopedia that I looked up in Mr. Anderson's office; I can't tell you whether it is the Encyclopedia Britannica or not. I was not concerned with the man that wrote the book, or anything; but the definition of convection, there I found a full treatise. In Mr. Anderson's office there is such an encyclopedia.

Q. When did you look that up?

A. I looked that up while I was waiting in his office to be called.

Q. And the article that you refer to contains merely a definition of convection?

A. It contains a very thorough discussion of the process of convection as applied pretty generally in the world; showing the causes of winds and so forth and the movement of atmosphere: Distinct application here.

Q. Will you obtain that book and bring it back after recess this afternoon so that we can look at it?

A. Yes, sir.

Q. Now is that the only text book or treatise on the subject of ventilation that you can refer to?

A. No, sir.

Q. All right what else?

A. I can refer you to physics,—a treatise on physics.

Q. What treatise on physics?

A. Any that has ever been written, providing it dealt with the question of heat.

Q. Well can you find such a book and bring it here so that we can examine it this afternoon?

A. I don't know whether I could this afternoon. I have no source of getting a Physics, unless I go to a book store.

Q. Well I would be very interested, Mr. Gibbs, to examine any article or any authority that you say supports your views of ventilation and convection; and I want to give you the opportunity to produce any authorities of that kind whatever, that you think will be helpful on this subject?

Mr. Underwood:

If your Honor please, I don't think it is up to the witness to go out in the open market and produce books, even at counsel's request.

Q. Or if you will refer us to one, a specific one, we will try to get it?

A. I refer you to the encyclopedia, that I will bring, which covers the basic principles on which ventilation in this ship depends.

Q. And you think that will be all that is necessary to support your views?

A. No I do not.

Q. —on the subject?

A. I think that a lifetime of application to my business, such as I have applied, will give you the ability to exercise the judgment,—or any other person, with my facilities, to exercise the judgment which enables me to make my statements.

Q. Of course we will have to give you credit for that, Mr. Gibbs; but of course in every field of science there are standard works, and I would like to know whether there are any standard works that you refer to in this field?

A. I will tell you that I am not much concerned with remembering the names of the authors of articles that I read; too much to think of, to do it. I am able to retain those articles that I have read, and what is in them has been of more interest to me than the exact date on which they were published.

Q. Now can you tell us what the vapor density of gasoline vapor is, with respect to air?

A. At the same temperature, gasoline density is greater than air.

Q. Can you tell us how much greater?

A. I think, slightly.

Q. When you say slightly, you mean ten per cent or fifty percent or—

A. Possibly ten per cent; you could probably find it in decimal points, depending upon the quality of the gas. There is a gas that would have a certain density, and another that would have a different density, depending upon the gasoline. The variations are extremely slight; we are splitting hairs. But I will tell you that gasoline vapor is heavier than the gas composed of nitrogen and oxygen, which is air, which is the combination of those two gases. That your gasoline vapor is heavier, and for purposes of this analysis I would be willing to concede that it is appreciably heavier.

Q. Well now I don't want a concession, Mr. Gibbs; I want your view,—your facts.

A. Well I state definitely that the gasoline vapor is heavier than the air.

Q. How much: Is that difference slight or great or appreciable? How much?

A. It's—the exact amount I do not know. I don't recall those figures.

Q. Well now something was said about—

A. But as I have looked it up and as I remember it, it must be about, some ten per cent heavier; that is as my memory serves me: But anyway, heavier.

Q. As I understand convection, convection is an effect, —a rising effect of gas produced by heat; is that right?

A. It is produced by the difference in specific gravity, which is usually produced by heat.

Q. That is if you have a mass of gas that is homogeneous, and the bottom part of it becomes heated, the—

A. It becomes what?

Q. The specific gravity becomes less?

A. Per unit of volume.

Q. Per unit, and consequently it rises in the mass?

A. Yes.

Q. And other gas falls to take its place?

A. Yes.

Q. And that creates a circulation; is that right?

A. Yes.

Q. And whether any gas will rise—

A. You said, if it is homogeneous.

Q. Pearhaps—I meant, all the same, a single,—I am supposing that this gas is the same gas and the same density?

A. Remains intact. We will say, if it is in that shape, it holds that shape.

Q. Let's assume, just to be theoretical, suppose we have a cube, a cubical container, that is absolutely tight, on all sides, and it contains a perfectly pure gas?

A. Yes.

Q. So that it is exactly alike inside?

A. Yes.

Q. Then as I understand it, the definition of convection is that that is the effect produced by heat, which causes the gas at the lower part of the container to become less dense and rise in the container; the denser gas is taking its place?

A. Yes.

Q. And that causes circulation?

A. Yes.

Q. Is that the theory?

A. Yes.

Q. Now whether any gas rises with respect to another one, depends upon its relative density, does it not?

A. No.

Q. Assuming of course that there are no extraneous forces acting on it?

A. Well, it might if there are no other extraneous forces, or other conditions.

Q. Speaking purely from a theoretical point, the rising of one gas with respect to another, is caused by their relative density; the lighter gas rising and the heavier gas falling; is that right?

A. Yes; and assuming there is no such thing as what we know as a mixing.

Q. You have told us, Mr. Gibbs—before I get to that, what is the flash point of any liquid? Can you tell me that?

A. Yes.

Q. Can you define that for us?

A. What is that?

Q. Just define it for us.

A. The flash point is the point at which ignition occurs—the temperature at which ignition occurs.

Q. Well if you have gasoline vapors with a mixture of air, so that it can burn, do I understand you to say that the flash point is the temperature that you would have to reach to cause the burning? Is that right?

A. That is what is commonly known.

Q. Now I would like to ask you if you consider flash point and ignition point, identical?

A. That is what I would consider it.

Q. Well what would you say of this definition of flash point: "Flash point of a liquid is the temperature at which it gives off vapor sufficient to form an ignitable mixture with the air contained in the vessel used"?

A. Well that is as I was trained, a highly different thing. That might be considered a point at which a liquid becomes a gas, which is known as the point of evaporation. In steam it is 212. Now you might speak of throwing the water on a stove, and it will flash at 212, if you call that the point of flash. The flash that I have been familiar with is the point at which it will explode,—or it will ignite. But what is commonly known in our text books, the point of evaporation,—the point at which a steam or any other gas changes place from a liquid to a gas,—evaporating.

Q. Now, the definition which I read to you, of flash point, is the one which appears in this Libelants' Exhibit No. 136, a publication—

Mr. Underwood:

For identification?

Mr. Matteson:

It was offered in evidence, but it is only for identification so far.

Mr. Underwood:

I have objected to it.

Mr. Matteson:

Entitled, Fire Hazard Properties of Certain Flammable Liquids, Gases and Volatile Solids, published by the National Fire Protection Association; and I show it to you here and ask you if that is the correct definition of flash point, or if it is not?

A. It might be. It might even be that in some accepted interpretations of the word, flash, that don't use the commonest expression. It could well be said that a point of evaporation might be classed as flash, by—in that paper.

Q. Well I call your to the definition of flash point, which appears in Kent's Mechanical Engineers' Handbook at page 4-45?

Mr. Underwood:
What edition?

Q. The 11th edition; which reads, "Flash point is the temperature at which oil must be heated to give off sufficient vapor to form an inflammable mixture with air". Do you say that is not a proper definition?

A. That is—whoever wrote that particular article, it is what he has called a definition of flash point. Flash is an English word, that may mean several things. You know a flash, when you throw a match on a piece of gunpowder, there is a flash. The flash point of gunpowder is the point of ignition. My definition of flash, is the point of ignition. Kent, or whoever wrote the article, can say the point at which the liquid changes place from the liquid to the gas. But I will say that as far as the infallibility of one man's nomenclature, that any gas, gasoline, turned into a gas, with the proper combination of air and heat, is explosive; but I don't see where temperature has got a thing to do with it except with ignition considered.

Q. Well Mr. Gibbs, you have told us here that you have been educated as an engineer, in a highly reputable technical school; that you have been practicing as an engineer for some twenty-eight or more years; that you are a builder of vessels, a builder of gasoline propelled and gasoline carrying vessels. And what I want to know is, after all this experience whether in all of it you have ever heard this definition of flash point to which I called your attention, before?

A. I have heard of flash point of lubricating oils; flash point of all kinds of oils.

Mr. Underwood:
May I look at that definition?

Mr. Matteson:
Have you a different one, of the older edition?

Mr. Underwood:
Yes.

A. Mr. Matteson, in my profession there are English words that have all kinds of application. The broadest sense of flash, means fire,—ignition. There are other kinds of flash, but if you want to know what I know about fuels, and would tell me what you meant by flash, I could tell you whether I knew anything about fuels.

Q. Let me ask you this Mr. Gibbs: Isn't it a fact that all inflammable oils are rated by flash points?

A. They have either that, or points of evaporation, points at which they change.

Q. Well now just let me get this straight. Throughout your profession, wherever you have to deal with an inflammable oil, inflammable oil is rated by its flash point, in those words, is it not?

A. Those are manufacturers' terms, that concern the quality of the oil. You get them mostly from oil salesmen, that would come in, to describe an oil for a promoter, for me, and I would ask him questions about it. If he used flash point in that form, we would probably understand each other. But—

Q. Isn't it true, Mr. Gibbs, that when you have to comply with government requirements with respect to different classes of inflammable oils, that those requirements are based on the flash point tests of the oil to be used?

A. Oh sometimes they tell us that the oil by a test must be of such and such a description; they will give us the specifications of the oil. We turn it over to the oil company.

Q. You say it is only a sales term?

A. No, no; that is unquestionably a technical description of the evaporating points, as given in that definition of oil,—of a fuel; and not intended to be the ignition point.

Q. I can't say whether it is a definition of an ignition point or not, Mr. Gibbs; but you are qualifying as an ex-

pert here, and I want to find out whether you know the meaning of technical terms in your profession. If you were called upon to install a fuel oil installation for the use of oil with a flash point of not less than 150 degrees, what would that mean to you?

A. A flash point of not less than 150 degrees? Do you mean that the liquid would remain? If I saw those low numbers, I would ask for a more specific definition of the word, flash. It would mean that was the point at which the liquid evaporated, or went into a gaseous form.

Q. You say if you saw the term, you would have to inquire—

A. Identify it, with 150 degrees, I would instantly know that they meant the point of evaporation. We have many new terms in the oil profession; cracked oil,—we have all kinds of new terms as in the manufacture of oil, which haven't concerned me, because I can get the information from time to time.

Q. If I understand it, Mr. Gibbs, this is your field?

A. Right.

Q. Building vessels for carrying of oil?

A. Right.

Q. And propelled by inflammable oils?

A. That is right.

Q. And do you mean to tell me that never until today have you seen this definition of flash point that I have given you?

A. Yes I have heard the flash point discussed, and I have heard it discussed by reputable engineers, as the point at which conflagration takes place.

Q. And you say that if you saw in a technical work or in a set of governmental regulations, or anywhere else, the term, flash point, that you would not instantly know that it meant exactly the definition that I have given you?

A. I will say this Mr. Matteson, that the characteristics of a fuel,—a manufactured fuel, that there is little oc-

casion ever for any expert on ventilation to know of a manufactured fuel put on the market.

Q. You say there is no occasion,—

A. There is little occasion for a man to know those specific technical specifications.

Q. Now you have built tank vessels, subject to the rules and regulations of the United States Department of Commerce have you not?

A. Yes.

Q. Built them to conform to those specifications?

A. Yes.

Q. How recently have you done that?

A. Well, we have been converting them, changing them over; we do that all the time.

Q. Well now I have here the United States Department of Commerce, General Rules and Regulations prescribed by the Board of Supervising Inspectors of Tank Vessels, and I call your attention here to page two, the regulation under H, subdivision 2; there is a regulation preceding it, and this number 2 describes the type of tank to which it is applicable, and it says,—a tank either empty or used to carry a liquid having a flash point of 150 degrees or above,—what does that mean to you?

Mr. Underwood:

Just a minute please. I don't want to object to the question, I just want to make it clear that the reference is to page 2 of the general rules and regulations prescribed by the Board of Supervising Inspectors, Tank Vessels, November 10, 1936.

Mr. Matteson:

I have already stated that.

Mr. Underwood:

I didn't so understand it.

A. Well, that would mean to me that at that point a gas would become—a liquid would become a gas.

Q. Well why would it mean that to you, if you don't so understand the meaning of flash point?

A. Because that would immediately identify those low terms. I know the properties of fuels,—combustion—basically. I know that those temperatures are approximately the temperatures of evaporation of such an article.

Q. Well now this does not say anything about what kind of an article it is. It simply says, to carry a liquid having a flash point of 150 degrees Fahrenheit, or above; it does not refer to gasoline or molasses, but I just says, a liquid?

A. Well, any liquid that I am familiar with, there is in it a gas at temperatures around that, or slightly higher. That in the range of evaporation temperatures. And I can conceive the word flash meaning a news item over the radio; a conflagration; or anything.

Q. We are all familiar with quite a number of uses of the word flash, Mr. Gibbs.

A. That's right.

Q. But what I want to know is, how much you know about the technical terms of the profession in which you claim to be an expert?

A. Perhaps many of them, terms of the profession, that the use I would give to you would not be the use that you would find in a paragraph of some man's article.

Q. Now as a matter of fact, I call your attention to the fact that right in these same regulations, you go farther down the definition of flash point appears; it reads: The term, flash point, indicates the temperature in degrees Fahrenheit at which a liquid gives off an inflammable vapor when heated in a Tagliabue tester. Now you say that you are not familiar with that definition of flash point?

A. I have another interpretation. I am thoroughly familiar with what it is,—the point of evaporation. The

term I was taught was the point of evaporation, the point of boiling, it is known in physics; it is known in Kent's as the boiling point of liquids. That is the flash point, as that definition says, is the boiling point of liquids; the transfer from a liquid to a gas. The name that an engineer knows, the boiling point.

Q. I see, and you don't know it as the flash point?

A. I did not recognize that as the flash point.

Q. May I look at the early edition of Kent that you have?

Mr. Underwood:

Yes, in a few minutes.

(By Mr. Matteson):

Q. Now what is the flash point of gasoline, can you tell me?

A. It varies, depends entirely upon what the gasoline is.

Q. Well within what limits does it vary?

A. Oh, it will run from 90 to higher; run lower than that.

Q. What is the lowest flash point of gasoline that you know of?

A. Well, others might run as low as 50 or 60.

Q. Well, I am not talking about ethers.

A. Well, other gasolines.

Q. Petroleum ether you are talking about?

A. Well, the various forms of petroleum products have various names, but as a matter of fact they vary, the points at which they become a gas, varies from one temperature to another. Now I don't know the temperature of that which becomes a gas at the lowest temperature, and I don't know the temperature at which is the highest temperature; I do not carry such figures in my head.

Q. Well, I appreciate you can't carry specific figures in your head, but you must have a pretty good idea about

these things, I should think, within reasonable limits. Petroleum ether is another name for benzol, is it not?

A. Dozens and dozens of names of liquids kindred to gasoline and kerosene.

Q. Now I am talking about gasoline, and it is your understanding that the petroleum product that is ordinarily known as gasoline, has a flash point of around 90 degrees?

A. It has various temperatures.

Q. What would you say would be the lowest? What is the range?

A. I would be guessing, in any event.

Q. You suggested 90 degrees; do you want to change that or correct it?

A. I say that there could be a gas that would have a boiling point of 90 degrees.

Q. Well what would you say would be the lowest that you would expect to find?

A. I wouldn't say.

Q. Well, 75?

A. I wouldn't say.

Q. You have no idea?

A. Oh yes, I have ideas?

Q. What is it?

A. I have ideas that gasoline could have what you call a flash point, which is not the accepted term,—the boiling point, of as low as 75 degrees.

Q. You think that would be the lowest?

A. No I don't it might not be the lowest.

Q. Well what would you think would be? You have been building tank vessels and gasoline engines?

A. The builders of tank vessels have practically no requirement to know the exact time at which a gas goes into a liquid, within any such margins as those, unless it was a special job.

Q. Do I understand that you want us to understand that you have no technical knowledge of the qualities of gasoline?

A. No, sir, I don't want you to understand any such thing. I have a very fair knowledge of all the properties of gasoline and fuel oil.—

Q. Well now we have determined what flash point is; I want your idea of what the flash point of commercial gasoline is?

A. I will—it is somewhere around the atmosphere, as a rule, in order that it be a fuel that is applicable to internal combustion motors. If the temperature is quite low, we will say 75, it would evaporate very quickly and would tend to make a quick starting motor; it is used in airplane motors and things of that kind. There are many newly developed motors that—some for quick starting, with various characteristics. In my profession, if I were designing a motor for any particular thing,—purpose, I would call in the oil man and make known my requirements.

Q. I don't want to interrupt you, but we seem to be taking a lot of time by going off with explanations here. What I want to know is this: What, as a man dealing with gasoline, is your idea of the flash point of gasoline?

A. Well my idea of the flash point of gasoline was, as stated,—was the point at which combusion took place.

Q. And where is that?—No, eliminating that. Now we get back to the technical definition of flash point that I have shown you here in three different places. Now let's use that. Now what is your idea—

A. What I have been taught, is boiling point, what I know as boiling point, or point of evaporation.

Q. You can call it anything you like, I have given you the definition of it. What is it with respect to gasoline?

A. It varies.

Q. What is your idea of it?

A. I have ideas that it varies around atmosphere, above and below; temperature of the atmosphere, above and below.

Q. And you say that would be around 75 to 90 degrees?

A. And higher; with particular—with the low grade of oils.

Q. And you wouldn't expect to find it any lower?

A. Flash point? Why I might find it as low as—away lower than that, very much lower, maybe 22 below freezing.

Q. Now we seem to be getting somewhere, Mr. Gibbs.

A. It depends entirely upon what it is offered and called as gasoline.

Q. We seem to have gotten from 75 to 90, and down to 22?

A. I say it is possible. I am not a manufacturer of oils, but I say that it is conceivable to me that oils could be made with a very low flash point.

Q. Again I refer to this book which has been marked for identification as exhibit 136, a publication of the National Fire Protection Association; Fire Hazard Properties of Flammable liquids, containing a tabulation of the properties of various liquids; and under Gasoline, on page 27, you see a column, Flash point; and you see under that, several figures, each with a reference which I can tell you refers back to the authority from which that flash point is taken; and I call your attention to the fact that flash point of gasoline is rated anywhere from minus 45 degrees, to zero by these authorities?

A. I think I told you it may go way down, below freezing.

Mr. Underwood:

Let it also appear that the definition of the gasoline referred to is C5H 12, to C9H 20; gasoline made up of five parts of carbon and 12 parts of hydrogen, to gasoline made up of 9 parts of carbon and 20 parts of hydrogen. That is my understanding of those chemical terms.

(By Mr. Matteson):

Q. And I call your attention to the authorities to which this refers back, Nos. 2, 22, 26 and 28, which I refer to over here. No. 2 is Interstate Commerce Commission Regulations, Bureau of Explosives—pamphlet No. 9 of 1922. No. 22 is Underwriters Laboratories, Inc., Report SI 528, on propagation of flame in pipe, and effectiveness of arrestors; 1919. No. 26, entitled Factory Mutuals—Properties of Flammable Liquids, Gases and Solids—April 1, 1930. And No. 28, publication entitled, Underwriters Laboratories, Inc.,—Method for the Classification of Hazards of Liquids—1929. Now in view of this have you any doubt now that the flash point for gasoline is somewhere between minus 45 degrees and zero?

Mr. Underwood:

If your Honor please, I want to put in a qualified objection to that question. I have objected to the introduction of this document in evidence on the ground that it is not properly proved, and not proof of the facts therein contained. I merely want to state that I stand on that objection, and I don't want to, by not objecting to this question, be in the position of allowing what Mr. Matteson proposed to draw from this document, to come into the record as proof of any fact.

The Court:

All right, let the witness answer.

A. These authorities quoted here, I have not read them. I therefore am not in position to tell you what is the lowest point at which a gasoline will become a gas,—the lowest temperature; but as I have said, it might be something extremely low, even below the freezing point of water.

Q. You have told us that you know quite a bit about gasoline, here, and the point of evaporation seems to be

quite an important point that is involved. You started out as high as 75 or 90 degrees, and now we seem to be down quite a bit. I want to know what your idea of the evaporation point of gasoline is,—the flash point of gasoline?

A. It depends entirely upon the gasoline.

Q. You say there is no—

A. You might as well say, how tough is steak,—about the same question.

Q. You say there is no recognized standard for the flash point for gasoline?

A. No, I say there is a definite and a specific point of evaporation on any fuel sold, with a certain chemical composition, which is invariable.

Q. And what is the flash point of kerosene?

A. I don't know; it would be considerably higher than gasoline.

Q. Have you any idea what it is?

A. No.

Q. Now, Mr. Gibbs, I think we agreed that outside of physical forces, the cause of one gas rising with respect to another, is relative density. When you say that relative density of gasoline and air is different by approximately ten per cent, that means that they are not very far apart, is that right?

A. Well that is very far apart, as far as one being heavier than the other.

Q. Well your have spoken of a tendency which you say there is for gasoline vapor to become dissipated by contact with air?

A. Yes.

Q. Now is that fact, that there is no more than a difference of ten per cent in their relative densities, a factor involved in that?

A. I wouldn't say so.

Q. Well of course if on the other hand gasoline vapor was three or four times as heavy as air, that tendency

would be reduced to a minimum if it didn't actually disappear, wouldn't it?

A. It would never, in my opinion, disappear, for the reason that you can take a very narrow test tube, a long cylinder column, where the process of convection would be greatly retarded, and put gasoline in it, however small, and smell it, instantly.

Q. What I am getting at is this; if you had two gases that were as far separated in their relative densities as three or four times, you wouldn't expect them to mix readily, would you?

A. It would be a factor of the speed at which they would mix; yes, sir.

Q. You wouldn't expect one gas, three or four times as heavy as another, to mix readily with the other gas, would you?

A. My judgment would be that it would not mix as readily.

Q. You wouldn't expect it to mix readily at all, would you?

A. Yes, sir.

Q. But that tendency would be greatly reduced if there were that difference between their densities?

A. I have never performed any experiments, or read of any, but I would suspect that that would retard the tendency to mix.

Q. Now as a matter of fact do you know that relative vapor density of gasoline vapor to air is three to four times?

Mr. Underwood:

If your Honor please, I object to that unless the density of the gasoline vapor is included in the question.

The Court:

I will overrule that objection; I think the witness is able to take care of himself. If there is any wanting ele-

ment in your question, why let the witness call attention to that.—If you can't answer the question, you think there is some necessary element that you ought to have incorporated, why then you call attention to it, Mr. Gibbs.

A. Yes, sir. This is one continuous sheet, isn't it,—all these pages?

(By Mr. Matteson):

Q. Yes.

A. Will you explain it to me, what the meaning of the table is?

Q. Well we will go back to the beginning of the book, and it defines vapor densities. Vapor density is the relative density of a vapor as compared with air, a figure less than one, indicating a vapor lighter than air; a figure greater than one, a vapor heavier than air. Vapor density figures in the table have been calculated:

A. That then describes the—

Q. The relative density.

A. When it says, vapor density, I couldn't understand that without this definition.

Q. Well you know generally the technical terms of your profession?

A. I know generally this book in which that is given as the rule for that column—what that column means.

Q. Vapor density ~~does not mean~~ anything to you as a technical term in your profession?

A. Oh, yes.

Q. What does it mean?

A. Density—it could mean a specific gravity.

Q. Isn't vapor density—

A. It could mean, it could be a coefficient; it could mean, with respect to some other thing. It could mean—in this instance it is told to mean with respect to not water—air, probably at the same temperature, at sea level.

Q. Isn't that the way all gases are rated in your profession?
A. What?
Q. Density, with respect to air?
A. It could be.
Q. You don't know whether it is or not?
A. Oh yes, I do.
Q. Well, is it?
A. In this particular thing that seems to be a common use of it.
Q. Isn't that generally so in your profession?
A. I wouldn't say so. I would say that that would be the logical description of it; but just given this column, "% in air ref."; I would need more—well I know now what vapor density is given.

The Court:
Let's get back to taw; what is the question?

(The last question was read by the reporter.)

A. This wouldn't mean much to me, when it refers to a gasoline that must evaporate at minus 45 degrees, which is—have you got one that would show it at normal temperature, of a more commonly used gas?
Q. Let me put it this way. The gas which would evaporate at the lower temperature, you would expect to be a lighter gas, would you not?
A. Not necessarily; I don't know that.
Q. Wouldn't you expect that to be so?
A. Well that refers to your—you mean, the gas itself?
Q. Yes?
A. I wouldn't necessarily think that would follow.
Q. Well now the question I asked you was, is it not a fact that gasoline vapor is actually three to four times the density of air? Now I have shown you this book?

A. With this table, that very low flash point, what you term flash point, states definitely that it is from three to four; that is in this table. My own knowledge, I did not know that exact point, for that exact flash point of gasoline.

Q. If as a matter of fact gasoline vapor, instead of being ten per cent above the density of air, is three or four hundred per cent above the density of air, that would have considerable to do with your theory with respect to the ventilation of gasoline vapors, would it not?

A. No it wouldn't affect it in any way at all; because the principles do apply today, and have always applied, and a denser article might work slower than a less dense article, with a relative mixture, and difference in weights. At the same time, as I told you, any figure of density that I might give, would be purely a guess, and a guess of ten per cent greater specific gravity, as I told you, which of course was a guess at the liquid gasoline, is—

Q. You don't consider the difference between ten per cent, and three or four hundred per cent, a material factor?

A. Liquid gasoline of course is a very different thing from the gas that comes from gasoline.

Q. Naturally, and we are talking about the gas that comes from gasoline?

A. Well my supposition of ten per cent is, as I remember it, from having seen it, was the gasoline.

Q. Well Mr. Gibbs, you are a technical man, and this publication that I have shown you seems to indicate the density of gasoline vapor is three or four times that of air?

A. I think that is probably true; I don't think there is any question about it.—what you have shown me; that the other gas which I confused with the liquid, either in your question or my memory, that I think it is probably three or four times as heavy per cubic foot as the same of air would be; I think that is probably true: Could be.

Q. Well now when you first told us that the difference was only ten per cent, do you say you had something else in mind?

A. I had the specific gravity of gasolines; just gasoline as against the water, for instance, as a standard.

Q. What is the specific gravity of gasoline, with respect to water?

A. I would think that gasoline is heavier than water, by a little; somewhere between one and ten per cent. Very slightly.

Q. Now Mr. Gibbs, we went over this very very carefully together, and I don't see how there is any misunderstanding. Isn't it a fact that when you told me the difference in specific gravity between gasoline vapor, and air, was ten per cent, that that is exactly what you meant?

A. I meant—I told you that I did not know; that my general guess was; and the general guess was based unquestionably on what—the figures I had recalled on the liquid, rather than the air, and vapor.

Q. Now again, speaking from the purely theoretical point of view, we agreed that one gas would rise against the other, when one was lighter or less dense than the other. We agreed as far as that, did we not?

A. If you could hold the two gases together,—I mean if you had a thin membrane that you could hold one,—a balloon, for instance, you could put your gas vapor in one, and the air vapor in the other; and this one was filled with gas vapor, and you brought a balloon in here filled with air, it would rise, the air would rise; and if you could hold them so they didn't mix with each other, that would—your gas vapor would stay at the bottom forever, and would never move, if you could keep the intermixing or any exterior force from causing that to rise.

Q. Right. Now whether one will rise with respect to another, then, depends on their relative densities?

A. And their ability to remain intact.

Q. Yes. Now if you have a gas that is three to four times as heavy as another, you have the heavy gas in a lower layer, the lighter gas in an upper layer, you will have to heat the lower gas sufficiently to expand it three or four times before it would become equal in density to the gas above, if the gas above remained at the same temperature; would you not?

A. You would have to heat it enough—I don't know what the relative rates of expansion of the gas vapor to the air are, but I think they are the same; but for the purpose of this question—

Q. It doesn't make any difference what the temperature is; you have to expand it three or four times before you get it to the same density as the lighter gas?

A. Assuming it remains intact.

Q. That's right?

A. That is right.

Q. And you would have to assume that the temperature of the lighter gas, during the process, remained the same?

A. What is that?

Q. In order to make the denser gas of the same density as the lighter gas, you would have to expand the heavier gas by heat, three or four times its original volume, while the temperature of the other remained the same?

A. That is right.

Q. Now that fact alone, if you had a layer of dense vapor below, and a lighter vapor above, would tend greatly to restrict the tendency of the two to mix, would it not?

A. There is a tendency to separate them—the difference of specific gravities; that tendency exists, with other tendencies.

Q. Well now do you say that the lower gas would rise above the lower level of the upper gas, before it had been expanded to a point where their densities were equal?

A. Some of it would, yes; eventually, all of it.

Q. And what would cause all of it to do it?

A. The mixing with the other gas.

Q. Well, the heavier gas would have no tendency to rise in the air with the lighter gas, at all, until it had been expanded three or four times, would it?

A. Oh, yes it would. It would become—every carburetor that operates, takes from—takes in gas vapor and air.

Q. By power suction, does it not?

A. Oh, it sucks air, free to get at, and it could take the air alone,—if this question of specific gravity was the controlling factor; you have air—gasoline vapor created in a tiny point; and you have in a great area, air; and as this suction occurs, or absence of pressure, air goes up thoroughly mixed, becomes what is known as a good mixer,—a homogeneous mixture. It is the property,—it is the mixing—

Q. Now will you explain to me,—eliminate outside air currents, or forces,—how the heavier gas—why the heavier gas would rise into the area of the lighter gas before it reached the density of the lighter gas?

A. Very well, sir. There is a tendency in all gases, to mix,—all fluids; just as you would put a tiny bit of litmus on one side of a car tank; and in almost no time, the other side of the tank,—you can pull a test tube full of liquid out of the other side of the tank and it is colored; meaning that this tiny speck of litmus,—a well known experiment in physics. A bit of musk may be put over there, and almost instantly it is mixed thoroughly and has come away over to this place here. Any moving picture theatre you go into, if you will merely gaze in the lighted portion where light hits the dust, and all air is filled with dust, otherwise there would be no light except in the direct ray,—you will see a tremendous turbulence in there,—in the moving picture auditorium; showing that rapid currents of the air, the motion of the air. There are in the bottom portions of the theatre, all kinds of gases,—those breathed from the audience,—of various densities. But

there is a general mixture of all of these things; and as one body, the air currents rises, due to convection.

Q. Just a minute, Mr. Gibbs, I am perfectly willing you should go on indefinitely:

A. I thought you asked me to explain it.

Q. In a moving picture theatre such as you have been talking about, you have ventilation of course, do you not?

A. Well it rises and falls.

Q. Yes; to begin with, you have induced ventilation, of course?

A. Not all of them; some of them do,—most of them.

Q. You have to have some in all of them?

A. Well that is just one general—the moving picture relies on the principle of convection, in the design of its ventilators.

Q. And you don't suggest that there is any serious difference in density between the various gases that are in the air in the moving picture theatre, do you?

A. Why I think there is some, the exact amount I don't know. But I do know this, that if you put a few drops of gasoline in a bottle and smell it, that that gasoline has left its condition of a liquid, gotten out of that bottle, it has become a vapor, it has mixed with air, and has arrived at your nose almost instantly, and it came from the bottom of the bottle.

Q. Do you know the reason for that?

A. Yes, sir.

Q. What?

A. I know that as those gases rise, in that gasoline, as they become a gas, that there is also air, and that there is no sharp disaphragm between them, and that there is a mixing; and I know that the difference in temperatures that exist caused the air to pick up, with its affinity of one gas for another,—causes them to circulate in that bottle. The smoke, it is coming out of your cigarette, you can see

it, but you can't see smoke still in this room; and you could not see the air in the bottle still, because of convection. The difference in,—we may say that one bit of the air,—forgetting the vapor, is slightly different in construction from the other bit of air; and that as both are heated below, the lighter one rises, and this turbulence—

Q. Are you assuming that heat is applied to the bottom of this bottle that you are talking about?

A. Yes, sir, heat is applied by the changes of temperature,—I mean, by heat, temperature that exists in all places on earth. There is probably different heat here, from here; but as air moves without friction, or almost without friction, you have it in a state of instability. To prove that, I performed an experiment as I have described. What happened is, that ventilators did exist in the glass without ventilators; that the air established itself, the colder part probably by the outside of the glass; the colder area, perhaps went in, and the hotter part came up in a natural ventilator in the middle, with no obstruction. As this turbulence, like the foam on soda water, for instance,—as this turbulence went over the top of the glass, the draft or air swept that away; and as air and gaseous vapors do not occupy themselves in straight lines that are fixed, but they mix with each other, due to the fact that convection causes them to mix. There is convection going on at all times in gas vapor alone. If for instance you had a bottle with gas vapor in it, subject to heat, maybe the coldness of this table now, and the heat of the table later, and could put smoke or some dust inside of that, it would be very turbulent, due to convection. Now if you had turbulence in a liquid, we will say, assume a condition where two inches of the bottle was gasoline vapor and three inches of the bottle was air, you would have rapid turbulence in each one of those two strips, and there would be a mixture where they would go together. And with the mixture, which is recognized fact, that gasoline vapor mixes with air, otherwise you couldn't run an engine.

Q. Well of course your gasoline vapor and your air are mechanically mixed in an engine, are they not and they remain mechanically mixed for an appreciable period after mixture, so that this revolution or turbulence of the air operating under this principle of convection, and your gas operating under the principle of convection, where they do mix they remain mixed for an appreciable time, as is proved by the presence of the mixture from the carburetor to the engine. If they did not remain mixed for some period you couldn't go to an engine that had been suddenly stopped, and apply a spark, as much as an hour later, and have an explosion. When you once mix vapor with air, you have something that is fairly stable. I don't mean to say that they won't dissociate themselves, although I don't know that they will to any marked degree, —quickly.

The Court:

I think we had better deal with solids a little bit now, get away from gases.

(Thereupon hearing was adjourned, to be resumed at 2:00 o'clock P. M. of the same day.)

Miami, Florida, November 15, 1939, 2:00 P. M.

Afternoon Session.

3698 Thereupon: GEORGE W. GIBBS a witness in behalf of the Respondent Phipps, resumed the stand and was examined and testified further as follows:

Cross Examination (Cont'd.)

By Mr. Matteson:

Q. Mr. Gibbs, you were saying this morning that a mixture of air and gasoline vapor in a cylinder of a motor

exploded by the carrying of a spark an hour later, is that what you said?

A. I said approximately one hour later; I have seen it done.

Q. If that were so, the car would start when you turned on the ignition, wouldn't it?

A. It is possible for it.

Q. You never knew one to do that?

A. I say I have known motors to start like that.

Q. You were also saying something about the affinity of air for gas; do you say that there is such a thing?

A. I say that in the presence of a turbulence at any time there is a mixture which remains to some extent—which remains to a large extent stable, not permanently stable, but for a period of time.

Q. If you had such a mixture of a heavier gas and a lighter one, if you left it awhile, it will settle out?

A. Not always; for instance, oxygen and nitrogen remain stable.

Q. Instead of making the question general, with reference to gasoline vapor and air, if you have a mixture of the two, the gasoline vapor will gradually settle out of the air, will it not, if there is no turbulence?

Q. Yes.

A. If there is no turbulence?

Q. Yes.

A. And no convection operating?

A. It may.

Q. Well it would, wouldn't it?

A. My experience shows that if it does, it is a very slow process; I have no experience that would indicate that it would.

Q. You spoke of some gases that had exploded in a gasoline motor after it had been standing for an hour; you have never seen such a thing to occur after it had been standing twenty-four hours, have you?

A. The reason—no—the reason would not be the lack of instability; it would be the fact that the piston rings changed the conditions in the engine; allowed the mixture to run out.

Q. Unless there is some fluid in the motor, the piston rings won't leak, will they?

A. There is practically no such thing as a tight piston ring; there are piston rings which produce tightness. One of the claims of the piston ring manufacturers is that after a long period of time the engine will suddenly stop, due to the fact that the piston rings were alleged not to leak.

Q. Getting back to this question of affinity; do you say there is affinity in air and gasoline fumes?

A. Under particular conditions there is a tendency for a diffusion of gases, which are within the same walled vessel.

Q. And that, however, is a mechanical mixture, either through convection or some other cause, is it not?

A. Probably; I am not chemist enough to tell you.

Q. You do not suggest there is any affinity between air and gasoline fumes, do you?

A. You mean any chemical affinity? Would you give me your definition of the word "affinity".

Q. As you use it; you suggested that there was some affinity between them; what do you mean?

A. I mean a tendency for the mixing of them for some reason.

Q. And that to which you refer is a mixing through mechanical means?

A. That is my opinion; it is either through mechanical means or maybe through some chemical process, of which I am not familiar; some chemical process that might set up. I do know that gases do mix.

Q. Of course it is true, is it not, that the explosive range of gasoline vapor mixed with air runs from about one and one half percent to six percent?

A. Six and one half percent.

Q. Yes.

A. Depending somewhat on the gasoline. You mean explosive mixtures?

Q. Yes.

A. Yes.

Q. And consequently diffusion up to the point where the mixture becomes leaner than one and one half percent, makes the combination more dangerous, does it not?

A. Not if it is too lean.

Q. Perhaps I don't make myself clear: pure gasoline vapor not mixed with air, is not explosive, is that right?

A. No, but to answer that I will have to have your definition of the word "explosive". It is combustible and will burn, but it will require a mixture of oxygen to have it turn rapidly enough to call it explosive, what is known as explosive.

Q. Let me get this right: if you had in a container, say in a cylinder of a gasoline engine, gasoline fumes with no air at all, pure gasoline fumes, and you set a spark to that mixture, would anything happen?

A. It would be fire-proof and nothing would happen.

Q. In other words, you would have to have some air present in order to have any burning at all?

A. You would have to have the oxygen that is in the air in order to cause combustion.

Q. So that as you add oxygen in the air, in mixture with gasoline fumes, the more air you bring in the more dangerous it becomes, until it passes the limit of one and one half percent?

A. Ninety-eight.

Q. Of ninety-eight?

A. Ninety-eight one half percent.

Q. Yes, if you look at it from that way; if it gets to be more than ninety-one and one half percent air, it becomes progressively more dangerous as you add air to it, is that right?

A. Yes, but you would have to have up to ninety-three or ninety-two or ninety-one and one half percent.

Q. When you reach ninety-three one half percent?

A. To ninety-eight and one half percent.

Q. In that range you get a violent explosion?

A. You get a most explosive mixture.

Q. Below the ninety-three one half percent you get a burning, is that right?

A. Not burning. I refer to the burning as a slow combustion, based on the rapidity with which oxygen can be supplied; for instance, if this were a solid tank of gasoline vapor and we applied a match here, that would burn as fast as the oxygen in the air could reach it, and finally burn up slowly; in order for it to explode, the oxygen must be there ready for oxidation at all points within the wall.

Q. Now we were talking about the mixture of gases where the air is mixed with gasoline fumes. In such a case, the oxygen would be present all through the mixture, would it not?

A. You mean for a homogenous mixture?

Q. Yes.

A. If it is homogenous there is the same amount in one tenth of a cubic inch as there is in the whole business.

Q. Of course; this sort of situation we are talking about is where the two gases become mixed, is that right?

A. Yes.

Q. Now the extent of the burning will depend upon the amount of oxygen available in the mixture?

A. You mean the violence of the explosion?

Q. No; I say the extent of the burning; I am talking about a situation where you have less than ninety-three percent of air. The extent of the burning will depend upon the amount of oxygen present?

A. Where you have less than enough oxygen.

Q. Less than enough for an explosion, but you still have oxygen in the mixture?

A. No burning at all in that instance.

Q. Let's talk about a situation where we have a mixture that consists of ten percent gasoline fumes, gasoline vapor, and ninety percent air; do you say there would be no burning at all in a mixture of that kind?

A. No.

Q. No burning at all?

A. You might possibly get some burning if it were hot enough, but in an open room there would be no burning.

Q. In other words, if into a container that contained ten percent gasoline vapor and ninety percent air you introduced a spark or flame, you would have no burning at all?

A. No.

Q. Why is that; how do you account for that?

A. By the very nature of the answers to the first question; the range between ninety-three one half percent and ninety-eight percent is the only explosive range.

Q. I am not talking about explosions at all; I am talking about burning. You say that if you had a mixture of ten percent gasoline vapor and ninety percent air introduced into a flame or spark, you would have no burning?

A. I would say there is no burning, but if you had some form of mixing or burner that would add oxygen to where you get in that range, it would burn; it throws it back into the same range to where it is diluted or overrich, and in neither of these situations is there danger of burning or explosion.

Q. Neither burning nor explosion?

A. No.

Q. Do you understand, Mr. Gibbs, that I am talking about a mixture of gasoline vapor and air which contains oxygen, all mixed up together, so that it is, as you call it

a homogenous mixture, and you say that a spark or flame will have no effect whatever on a mixture of that type?

A. No.

Q. Can you refer us to any treatise or text-book that would give us any information on that subject?

A. Merely the information brought out in the definition or description of the explosive points of the mixture.

Q. Do you recognize no difference between explosion and burning?

A. Oh, yes, I can; the burning is the application of the right amount of oxygen to cause combustion; burning is slow where the air can't get at it; you may take a room full with that rich gas and pour it out to where the proper amount of oxygen could get it, then it would burn; but if you only poured it in the presence of heat, with no better mixture than you had, you would not get burning in my opinion. I never performed the experiment; I am just giving you my opinion.

Q. Would your answer be any different if you had this mixture and it was open to the air, so that air could be admitted gradually?

A. If the air could be admitted, I think it would soon reach the place where explosion or burning would be possible.

Q. In other words, if you had the bilge of a boat filled up with a mixture of ten percent gasoline fumes and ninety percent air, and a spark or a flame were introduced into that mass, what would happen then?

A. Nothing.

Q. Nothing at all?

A. If it was out of that range.

Q. You understood my question was referring to an open bilge, did you not?

A. Yes, sir.

Q. So that there would be air within the mixture I am talking about?

A. That would be a homogenous mixture, ninety percent air and ten percent fumes.

Q. I understood you this morning to say that the only purpose of ventilation in a gasoline vessel in the engine-room was to furnish air for the men and air for the engine, is that right?

A. Well, it has, of course, general purposes, allied purposes; if there is some disagreeable odor of gasoline—in other words, the sole purpose of ventilators is to change the air, cool the air or settle the air in a vessel. That is what I am trying to say.

Q. Could you see any purpose in applying ventilators to a gasoline boat for the purpose of removing gasoline fumes from the lower parts of the vessel, or in the bilges?

A. I assume that it has windows—ventilators are the result of earl use, even long before the use of power inside of boats, internal combustion engines, before the days of internal combustion engines.

Q. You say that such things are no longer used?

A. No; I say that they are used for a very important purpose. They may assist slightly in some cases, but as a means of removing gasoline fumes, cowl ventilations are not as effective as people think they are; they are most inefficient, but assuming you have windows now—if you have no windows, then they are essential; you must have openings.

Q. Now do I understand you, Mr. Gibbs, from the point of view of a designer, that it would be impracticable to design ventilators for the purpose of removing gases from the bilges, because you couldn't determine how much gas you might have to remove?

A. No. I don't remember that I said that. I can tell you my opinion about that.

Q. You were asked some questions by Mr. Underwood and you answered them, and the effect of your testimony seemed to have that import, as I gathered it. Now, Mr. Gibbs, I want to be sure we understand each other on it.

Do you say that it would be impracticable to design ventilators for the purpose of removing gases from the bilges and lower parts of a gasoline boat, because it would be difficult to determine how much gas you might have to remove in a given time?

A. I would say that it would be impracticable to desgin a ventilator that would remove an abnormal condition, of gas inside of a boat.

Q. What do you call abnormal; what is that?

A. Like in the case of a collision or where some heavy piece of machinery is dropped on the gasoline line—a condition like that; you might have a leak that might dump the contents of a container into the bilge of your engine room; force-draft ventilators in my opinion could be designed which would be much better than windows—if you have no windows you could use what is called a ventilator.

Q. I think we can readily agree on that, a condition could arise which would precipitate the contents of one of these five-hundred gallons tanks in the engine room bilges,—nothing would take care of that. I am not talking about a case of that kind. I am talking about a case that might arise where there is a slow leak in a gasoline tank or feed line or some connection resulting in gasoline fumes settling in the bottom of the ship in a determinable quantity: do you say that it would be impracticable to design ventilation to take care of a situation like that?

A. I think that you could design ventilation which would aid the situation if such a situation resulted, but that a designer would not contemplate, in the design of his ventilation, such an accident, because the amount of it is undeterminable. The assumption that you are going to have gasoline leaks in a boat assumes that you don't know how to design a boat or can't properly construct it to start with,—except in the case of an accident—

Q. Your rule of design then is to make your tanks and your connections and your gasoline lines so perfect that

throughout the life of the boat that there will be no possibility of any leaks occurring, is that right?

A. Yes. Of course you provide windows and other means of ventilating such things.

Q. Now as a matter of fact, Mr. Gibbs, you know that there is no gasoline boat in existence that does not sometimes have leaks in her feed line connections or somewhere in the gasoline system?

A. No, I don't know that at all.

Q. Did you ever know a boat throughout her life that you never had to tighten a connection to take care of a leak in the gasoline at any time?

A. I know of a great many boats that I don't think ever had a wrench on that important thing known as the fuel line.

Q. You suggest that such a hazard is so uncommon that a good designer would not take it into consideration at all?

A. I think that a good designer would take it into consideration and he might try to apply a remedy for any normal thing that could happen.

Q. What do you call normal?

A. It may be that in fueling they failed to shut the gas off and it might slip down and jamb through the window or in some way get in the boat. I think that can happen. I think you want a system of ventilation that tends to keep the air cool; maybe that is your point, or my point; to keep the boat cool and supply the air for the engines, and I think that is a far greater service than the clearing of the room of fumes; I might say that the ventilation system is not ordinarily designed with the view of taking gasoline fumes out of the boat. In recent years there has been considerable work done on power methods of clearing a boat under the circumstances that you say might happen—leaks—but the ventilation I am referring to is non-mechanical not power driven ventilation.

Q. Of course there are other ways besides leaks that you might anticipate that gasoline would get into the bilges of a gasoline boat?

A. Yes.

Q. You referred to the practice of washing down engines with gas?

A. Yes; a bucket turns over.

Q. Or the bucket turns over?

A. Yes.

Q. The handling of gasoline in an engine room may create fumes?

A. Yes, sir.

Q. For instance, you referred to this five-gallon can--if it were repeatedly filled under this drawoff line and discharged outside of the boat, you would have a discharge of gasoline fumes in the engine room every time the gasoline can was refilled?

A. If that was filled outside of the engine room?

Q. I said if it were filled repeatedly in the engine room?

A. In the engine room?

Q. Yes.

A. You mean from the drawoff cock?

Q. That is what I said.

A. Yes.

Q. If there had been times that this gasoline can were placed under the gasoline drawoff and filled with raw gasoline, which was delivered outside of the vessel, and the can brought back and put under the valve again, you would have repeatedly discharged the gasoline fumes in the engine room each time that process was completed?

A. Where from?

Q. From the can itself?

A. No.

Q. You say no?

A. Yes.

Q. If you filled a can like that with gasoline and poured the gasoline off and put the can down on the floor, you would have a can full of gasoline vapor?

A. That depends on where you pour that gasoline off. Do you mean that you pour the gasoline off inside of the engine room?

Q. No, outside the engine room.

A. If you pour the gasoline can outside of the engine room you would put the bottom of the can higher than the top of the can in order for it to pour off, and gas vapor being heavier than air, it would pour out and the air would take its place, so you would carry back into the engine room a can filled with air.

Q. Pure air?

A. There may be in that case some intermingling, but it would be pretty pure air; that is, if there is anything to the weight theory.

Q. I am ready to assume with you, Mr. Gibbs, that when you pour off the contents of a can full of gasoline, that the whole contents of the can goes out, including any vapor in it at the time, but you do have that can and though you empty it, you do have that moisture of gasoline, do you?

A. Not very long, if you carried it outside and dumped it; you might have an odor, but it does stay long.

Q. It doesn't stay long because it evaporates?

A. Yes; it evaporates very fast.

Q. Evaporates inside of the can, doesn't it?

A. It evaporates while it is going out and while the air in coming in; as that stuff flows out it is followed in with air; it is just this turbulence right over the top of the can; the air rushes up over the top and replaces it. Now there is some intermingling of the stuff, but the air would go in through the top, would go in through the top of the stream of the gasoline, and would dry it up. I don't think you would carry back even a moist can, probably not even a damp can.

Q. Then I take it, according to you, that after you had discharged the contents of the can of gasoline and turned it upright again, it would be perfectly safe to drop a match in it?

A. That depends on the interval; it might be perfectly safe; it would in a very short time be perfectly safe.

Q. Mr. Gibbs, would you be willing to take this can down to the gasoline station around the corner and fill it with gasoline, and then empty it out and let it stand for one hour and then drop a match in it?

Mr. Underwood:

I object to that, if your Honor please; I don't think that Mr. Matteson—

The Court:

Overruled. Answer the question.

A. Would I be willing to do that? I think I would.

Q. I hate to ask you to do it, Mr. Gibbs, but—

A. I will state that I have already done it, but it was after a little longer period than an exact hour.

Q. Then if a gasoline tank has been open to the air through one or more of its openings for a reasonable length of time, I take it that it would be perfectly safe to apply a spark to it without any particular preparations at all?

A. Did I say that?

Q. I am asking you.

A. No.

Q. Why not?

A. In the handling of a case like that you exercise every known precaution, in fact, in all cases; and a shop like ours, like any other good shop, takes no chance on leaking gases. I can conceive of conditions that would cause a gas to be non-homogeneous, where one little section of the gas is all right and the other isn't. You might walk in an underground cellar that has been closed up, and walk

all around, and then all of a sudden certain conditions arose which would get to a narrow range of explosive mixture which accentuates the rest of it. Now in a large ten thousand gallon steel tank that they wished to use for gas, green gas, we were asked to make it gas free in order that certain repairs could be done, and the rule for that is to run steam through it 24 hours; after that we fill it completely full of water; when that is done we put a heavy pressure on it, and if leaks show up anywhere, we caulk the leaks. We have just caulked some oil leaks in a very expensive steam yacht, and that has been done by filling the compartment with water completely, and the leak has been repaired below the surface of the water; in other words, the void where the gas or fuel was has been displaced by water or by something else, and when you do repairs you take into consideration the fact than an explosive mixture might be lurking at some point, and when confined it is pretty dangerous.

Q. Then you don't thoroughly trust your theory of ventilation through convection, do you?

A. I do trust it in a given element of time. In a given length of time all gas would eventually leave; practically all gas would eventually leave a pace that wasn't confined.

Q. What element of time would be required?

A. What element of time would I require?

Q. Yes, what element of time would you require?

A. Depending on the amount of the leak; if it was the kind of gas that would come off of that—I don't know how it is referred to—but with these drain cocks the element of time would be very, very little, because the small amount of fumes that would come out of that tank would practically mix with the air and be wafted out like smoke coming off of a cigarette.

Q. I think you must be talking about something different from what I said. I am talking about a tank that has to be worked on, not any valves anywhere.

A. Oh.

Q. You said that any gasoline fumes in a tank that had been used for gasoline would be dissipated under your convection theory?

A. In time. But vents in a gasoline tank are extremely small at the top—sometimes at the bottom—the holes in the average gasoline tanks are extremely small.

Q. Now you have got holes in the tanks of the Seminole that have been open for a period of three or four years; would you consider it was safe to work on those tanks without preparation of the tanks?

A. Did you say for a period of years?

Q. For the period from 1935.

A. I think it would be perfectly safe. I know as a matter of routine that we wouldn't allow it done in our plant and I don't think any other boatyard would.

Q. Why?

A. Because when we permit it to be done today on my judgment, and tomorrow, 20 minutes after the gas left the tanks or the Seminole's lines—we have rules and fire drills.

Q. What is the purpose of these rules?

A. These rules are to leave nothing to the judgment—nothing of that nature—to anyone, but to go through the motions of complete inspection through displacement and steam them for a great period of time.

Q. You have described to us the method of preparing a tank for heat work by the application of steam for 24 hours?

A. Yes.

Q. That is the usual requirement for such work, is it not?

A. Yes, 24 hours is the usual requirement.

Q. You would not work on a tank such as one of these in the Seminole in your yard without having gone through that process of steaming it for 24 hours, is that right?

A. No, I would; it depends on the element of discipline and routine; I would not hesitate to work on that tank

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after we had done two or three other things to it, which would not take us as long as 24 hours; the 24 hour period was in order to make it more than sufficient. Where human life is at stake, with the abnormal things—putting this intense heat in a *vented* surface. Now we put water in the tank and work on it below the level of the water, and that is in order to prevent us from burning through and getting a flame inside the tank. It is only for the outside crevices that we heat.

Q. You caulk a tank that is partly filled with water, do you?

A. Oh, yes.

Q. You wouldn't burn out a rivet with that method?

A. No, sir. If there was water in it you couldn't because the water would—you could get intense heat enough to do it, but that is not normal shipyard practice, at least none that I am personally familiar with.

Q. Now I think that you said engines of the type of the Seminole, as large as the engines of the Seminole, require priming?

A. It is possible to start them perhaps without priming, if you have enough air, but the practical thing is to prime them.

Q. As I understand your testimony, Mr. Gibbs, you said that in any vessel where you had gasoline engines as large as those in the Seminole, that it was necessary to make provision for priming the engines, is that right?

A. Oh, yes; it is a practical operation and an engine builder builds them that way.

Q. And that is true of engines built today as well as of engines of the age of the Seminole's engines, is that right?

A. Yes, every internal combustion engine may be primed. They are not primed as much as they were for certain mechanical reasons I will explain, if you wish me.

Q. Don't bother about that. Wherever you have engines of the size of those on the Seminole it is necessary to make provision for priming the engines?

A. You are entirely right.

Q. I think you said that you built a number of vessels in your yard, gasoline propelled, with engines as large of larger than those in the Seminole?

A. Yes.

Q. You say provision was made for priming with respect to those engines?

A. Yes.

Q. Well, what vessels have you built up there recently with provision for priming?

A. Well, the vessels that we have built recently are Diesel engines; in fact, nearly all "engines" that we are building is Diesel, but we are building a tugboat with a hundred horsepower gasoline engine with provision for priming it. I don't know the name of it; the owner will give it its name.

Q. Why is it that Diesel engines are coming into more common use than gasoline engines?

A. Because they run on a cost of about—anywhere from about one-fourth to half the cost of the gasoline engine, and because they are more free from fire hazard.

Q. Why is that?

A. Because they burn oil which is hard to cause to burn when it is locse.

Q. Why is there this difference in burning quality between the oil used in a Diesel engine and gasoline?

A. One is more volatile, and the other is the tendency for the gas to get away. I have known ships with oil in the bilge, heavy oils, where people are smoking and where there was a Scotch boiler running, as a matter of fact.

Q. The fire hazard is substantially less with a Diesel boat than with the gasoline boat?

A. Yes, sir.

Q. What is the flash point of the oil used in the Diesel engine; can you tell me?

A. I don't know; I know generally that it is highe. than that of the gasoline and the more volatile fuels.

Q. About what is the flash point?

A. I don't know that: I am not a chemist; I do not know their chemical contents, but I know their general properties, and for the specific figures applying to those properties I would ask a chemist or the man responsible for its manufacture, regarding those things.

Q. Of course if a gasoline engine were perfect in all its parts there would be no fire hazard in connection with a gasoline engine, would there?

A. You mean even in the filling of the tanks? If there were no possibilities of any leakage of gasoline in a gasoline boat, there would be no fire hazard.

Q. And if a gasoline boat is properly—

A. Just a minute; I would like to correct that. She might get into a general conflagration, in which case she would be more dangerous than any other type of boat from outside sources.

Q. You were speaking of filling; the filling pipe is, of course, a part of the general installation, is it not?

A. I wasn't referring only to that. I have had a great deal of experience with the operation of boats for both pleasure and commercial purposes, and very often a man will go to a filling station or depot and get a can of gasoline and put it down in his boat, and kicks it over and drops it; so with the Diesel job, if it was Diesel oil, and you kicked it over in the bilge, you would have very little danger of fire or explosion in the room. You might be working on your gasoline and had one of these big cans and you might drop it, one of these square cans; I have known this thing to drop and crack a soldered seam and you put soap on it to stop that leak. If you are handling gasoline aboard a gasoline boat, you have a boat that is more dangerous, more susceptible to fire hazards; than one handling something which has a very low volatile point.

Q. Below the deck, I take it, there would be no difference in the danger between the Diesel boat and the gasoline boat?

A. Assuming there were no leaks?

Q. Yes.

A. Yes, if there were no leaks.

Q. I gathered from your previous testimony that leaks in a gasoline boat were so unusual that it wasn't necessary in the design of a boat to make any provision for removal of fumes that might come from that source. Do you adhere to that testimony?

A. I think you gathered something that I didn't intend to testify. I said that the lines could be made tight, but that it would be impossible to anticipate just what kind of a leak would occur, and that ventilation provided for air to the engine, which is many millions of cubic feet, and that it is quite sufficient to do that with ventilators of the non-power type.

Q. Now, Mr. Gibbs, isn't it a fact that the possibility of leakage from gasoline lines or connections below deck is a well recognized and serious hazard in gasoline vessels?

A. Well, it does happen in vessels, but not in good ones, but there is no apparent need, no need, to be apprehensive for leaks in lines that are properly designed and installed. Some vessels are like junk automobiles and fires occur from things of that kind.

Q. If a gasoline did occur in a vessel would you call it a junk vessel?

A. I would have to know the cause of the leak.

Q. Well, in the ordinary course that is nothing extraordinary to understand?

A. Well, it would not be an unknown case. We could drop a hatchet or hammer on the line, and you could go there tomorrow or any other day and rap on a pipe and cause a leak, but at that time you could take a pump and dry your bilge out and repair the leak. One of the most dangerous things known to life is a gas stove, and those lines are put in where even they can't be inspected and they never leak; if they are tight to start with, they remain tight. There are cases where perhaps that doesn't

apply, but no one ever thinks to have an inspector come out to see whether their gas pipes are leaking.

Q. Would you call seepage from such connections such an extraordinary hazard that it doesn't have to be anticipated at all?

A. It is a most unusual hazard; in other words, the primary purpose of the ventilator would take care of any seepage that occurred, and you wouldn't add additional ventilation to take care of such leakage; if you had a major accident which created a leak, it could be corrected by the repair of the leaking part, but a ventilator—oh, I think what I have said covers it.

Q. Do you build gasoline pleasure vessels?

A. Oh, yes.

Q. Name one, for instance?

A. The Fortuna is one.

Q. What size is she?

A. 80-foot houseboat, similar to the Seminole.

Q. What sort of engines has she got?

A. Murray & Tregurtha.

Q. Do you build any stock type of pleasure vessel?

A. We built a great many—our only stock boat today is a steel tug which may be operated with either gasoline or Diesel, at the option of the buyer; and a power seaskiff which we make in great quantities, which are gasoline driven.

Q. Are those vessels piped with brass pipe?

A. The little engines are practically without piping; they only carry a gallon, and they have a small copper tube from the top of the carburetor.

A. I didn't ask you that; I asked you whether they vessels are piped with brass pipe.

A. They are little one-horse seaskiffs, and the whole thing is built in that—there is a small copper tube that goes from the tank to the carburetor.

Q. On the gasoline tug boats what do you use?

A. On the gasoline tug boats we use brass pipe, and in the Diesel iron pipe.

Q. Iron pipe?

A. Yes.

Q. Of course there is considerable distinction between Diesel oil and gasoline as to the pipe to be used, is there?

A. Yes.

Q. What is the difference?

A. The difference is in the corrosive action of the two. Diesel oil is very bad for copper tanks.

Q. Why is that?

A. Probably due to the presence of sulphur in the oil.

Q. And you get sulphur in gasoline to some extent?

A. I think some of it does have it; it is not supposed to be there, but some of it has it but nothing like the extent to which it is in the crude oils.

Q. You will find some of it in all gas?

A. I think it is possible to find some small quantity in gasoline, but very small.

Q. Has the Fortuna got copper tubing or copper piping in her?

A. I don't remember that detail, but unquestionably she would have had it and brass pipe when she came from us.

Q. Do you know where she is now?

A. No.

Q. Can you tell us the name of her owner?

A. Her owner is dead; it was Mr. Richmond Talbot of the Port of New York.

Q. Have you belt some gasoline propelled tank vessels?

A. We built the Leslie, at least it was built under our supervision, and she had large Palmer engines with brass pipe; I remember that distinctly.

Q. Was she a tank vessel?

A. Yes.

Q. What size?

A. 110 feet or thereabouts.

Q. Who was she built for?
A. Built for the Gulf Refining Company.
Q. When was she built?
A. As near as I can recall, about 1914 or 1915.
Q. Have you built any tankers recently?
A. With gasoline engines?
Q. Or steam.
A. Nearly everything we have built has had Diesel engines, passenger or otherwise, with the exception of government vessels, and we have built a great many of those.
Q. What government vessels have you built with gasoline engines recently.
A. We built 16 rescue boats of 200 horsepower Kermath gasoline engines.
Q. What size were they?
A. 30-foot boats, about 26½ miles.
Q. Are they open vessels?
A. They are semi-open; the engines are under cover, sort of a box, and the pilot steers from the semi-open house and the forward part of her was closed, where he can go in and sleep.
Q. Have you built any larger vessels than that for the government?
A. Yes, we built some 80-foot, 30 mile boats, 1600 H. P.
Q. Were they gasoline driven?
A. Yes, sir.
Q. They were for the costguard, I understand?
A. That is right; they were for the Coastguard.
Q. How recently did you build those?
A. Just a little while ago; just a little bit prior to the last contract on the rescue boats.
Q. Are these 80-foot boats in service now?
A. Yes.
Q. Any of them in this vicinity?
A. I don't know.
Q. Do you know the names of any of them?

A. They only have numbers; they have no names. They are known as 80-foot, 30 mile boats; I don't think there are any others; I think we are the only ones that built them.

Q. They have an engine room, do they?

A. Yes, they have an engine room.

Q. And their engines require to be primed, do they?

A. Oh, yes; no, they don't; there is provision for priming but they don't—none of these boats would I say would fail to start unless primed.

Q. But, as I understand, it was necessary in connection with them to make some provision for priming?

A. That is right.

Q. What make of engines were they?

A. Vimalert. Mr. Matteson, may I make a statement about priming and avoid a great deal of discussion later on.

Q. I think we understand each other, however, I have no objection.

A. What?

Q. I have no objection, but I think we understand each other.

A. Well, priming and choking are the same thing, answer the same precise purpose; you may either take gasoline and pour it in the head or you may, if you have enough electricity, cause a vacuum, a high vacuum, in your intake line and increase the suction on your gasoline and take a very rich mixture into the head of your engine, which serves the purpose of priming, however, all engines that act through a choke, as does the automobile, have means of priming, including the present day automobile.

Q. I am not sure that I can understand you. I understood you to say that all engines of this size required priming, and we are talking about only one thing and that is priming through a petcock; for instance, take these engines here, the Vimalerts, is there provision made there for priming through the petcock, a petcock?

A. A provision for supplying gasoline through the heads with a choke, which is the same general thing; it would seldom be done.

Q. Nevertheless, provision, was made for priming through the petcocks, if that were necessary?

A. On that big engine it was necessary then and would be today if such an engine were built.

Q. And there was provision for that on these 80-foot boats you spoke of?

A. Yes, sir.

Q. How were the gasoline tanks located on those 80-foot boats?

A. The exact detail of that I don't remember.

Q. What kind of tanks did they have?

A. They were of an everdura metal, a metal thought to be the very finest form of metal, but a metal that I understand today is not so highly considered as it was then.

Q. That is a non-ferrous metal?

A. It is a combination of silicon and bronze; it is called silicon bronze.

Q. That would be non-ferrous?

A. That is true.

Q. What shape were those tanks?

A. I don't offhand remember that.

Q. What was their capacity?

A. I don't remember.

Q. What kind of piping connections were there in the tanks and the motors?

A. In those 80-foot boats, as I remember, was tubing.

Q. Copper tubing?

A. Yes, rather heavy copper tubing.

Q. They were built according to the Coastguard specifications, were they?

A. Yes.

Q. And the specifications called for copper tubing, did they?

A. In that instance they were built according to the Coastguard specifications. We had nothing to do except carrying out the specific specifications.

Q. Did they have drawoff valves in the engine room?

A. Those particular boats, I don't think they did.

Q. What provision did they have for ventilation in the engine room?

A. They had mechanical blowers; Yes, I know they did.

Q. How were they installed?

A. Through a row of conduits and electric meters; the entire ship was mechanically ventilated with force-draft.

Q. And these blowers; where did the gas go; go to the bilges?

A. That detail of those boats I don't recall, but most likely they did. The floor part was very high, and the engines sat up on beams and carried the—

Q. To the best of your recollection they had forced ventilation to the bilge?

A. I am not prepared to make any statement on that at all; I don't recall the arrangement.

Q. Could you give us the specifications of those boats?

A. I don't think there would be any objection to it, but we are not giving out any specifications without permission of the government at this time.

Q. I understand that you have not built any gasoline tankers lately?

A. Not within the last few years have we built any.

Q. So far as conditions in the engine room are concerned in a gasoline driven motor tanker, do you say that the requirements for ventilation for safety are any different than they were on the Seminole?

A. You mean installation, complete installation?

Q. Yes.

A. I would say entirely different.

Q. Why would there be any difference?

A. In the first place, a tanker has but one duty to perform, and the Seminole had many duties to perform; the tanker has a skilled crew, with no passengers, and the Seminole had passengers and a crew that was unskilled and undiscipilined, as well as a crew that was under no supervision of the government in any way.

Q. I gather from that, Mr. Gibbs, that the requirements for safety in construction would be higher in a vessel of the type of the Seminole than there would be in a tanker, for the reasons that you have given; is that correct?

A. In which would be higher?

Q. In the Seminole than in the tanker?

A. Yes, they would be different; the question of that drawoff valve I think was peculiarly essential in the Seminole as compared to a gasoline tanker, although in that particular thing a drawoff valve would have been all right there, in fact, in any boat with gasoline engines; if it were for priming alone I think that would be a good thing.

Q. And you would say that a drawoff valve would be as proper in a tanker as it would on the Seminole?

A. If there were a danger at all in connection with it, with the drawoff valve, it would be less indicated in a tanker than in the Seminole, because you don't have to handle gasoline for purposes other than the priming of the engine. I think that there is some slight danger to the drawoff valves for gasoline in the engine room, provided you could completely do away with it. Now you could put enough batteries in a tanker to speed the engine so that the inefficient method of choking would give you your gasoline for priming. These engines that were air-cooled—and that was the only way at the time that was developed—had a very limited amount of air; it is not practical to have much, and they had to start, without the necessity of the slow process of fueling, which involves a large amount of machinery and air compression in order to suck up a little richer mixture than is otherwise used.

With the tanker I would probably go to the expense of installing the engines and eliminating what you might say was the smallest hazard, because when a tanker explodes in a congested area it explodes many thousands of gallons of gasoline, of fuel; it is carrying a much more dangerous cargo, than the human or just pleasure passengers.

Q. I take it that you agree that there is some degree of hazard about a drawoff valve; is that right?

A. Oh, yes.

Q. And in your opinion that hazard, if it existed, would be greater on a yacht than on a tanker because you don't have this experienced personnel on the yacht as you do on the tanker?

A. Not only that but as a practical proposition a tanker is a valuable thing, earning a great deal of money, and goes far more than a yacht, and under such an arrangement you could go to the electrical device which would perform the operation of priming.

Q. Assume for the moment that we have drawoff valves in both of them.

A. If you had the same kind of an engine I would say that even in the tanker a drawoff valve would have been a satisfactory way of getting that priming fuel.

Q. As I understand it, the Seminole customarily carried fuel in her tanks, not only for herself but for the purpose of supplying gasoline to other vessels that might be in her company?

A. She was a mother ship of a fishing fleet, as I understand it.

Q. In other words, she carried fuel not only for her own consumption but for the consumption of other vessels?

A. Yes, sir.

Q. And to that extent she might be regarded in the sense of a tanker herself, is that right?

A. Well, no; she carried a small; we know what she carried and we know what a tanker carries; a tanker car-

ries her entire displacement with fuel, every available inch of her is tanks.

Q. 2000 gallons of gasoline is a very substantial quantity of gasoline, and if it is set free and on fire by explosion or other accident—

A. Well, it is not as great a quantity as ten times that; it is a considerable amount of gasoline, but nearly all yachts carry that much. The Seminole is not materially different from other yachts; the Seminole had no range, no distance to go; the average yachts takes fuel to carry it for a great distance where gasoline cannot be obtained, so that she can return.

Q. The hazard to lives on board and property in the vicinity, you would not minimize in the case of an accident to a vessel like the Seminole?

A. I would not minimize it.

Q. You would not?

A. She would be like any other yacht lying at a dock, her fuel would be less than in some yachts.

Q. You were drawing a distinction between a tanker and a yacht like the Seminole, as I gather it, based on the degree of hazard in the presence of a relative quantity of inflammable oil carried on board?

A. Yes, I would say the greater the weight of the amount of combustible fluid the greater the hazard.

Q. By the same token, Mr. Gibbs, you would not say that the amount of gasoline carried on the Seminole was a negligible hazard, would you?

A. Well, it was the same hazard that would exist in any yacht of her size, no greater.

Q. Is that right?

A. Yes; most of the oil, as I understand it, was for the use of outboard motors which would take as much as two gallons at one time, maybe five, the big ones ten.

Q. Are you familiar with the government regulations with respect to the construction of gasoline propelled tank vessels?

A. No; I know generally some of them.

Q. I gather from your testimony that you would not hesitate to install on a tank vessel a drawoff vessel.

A. I would hesitate if the Department of Commerce refused to let her sail if I didn't obey one of its rules, and the first thing I would do would be to get the requirements, providing that the oil company giving us the contract asked us to do it, but in all our work, in nearly all of it, we merely work to blueprints, and those things are looked after by the designer. Where we design a ship, or collaborate with the architect employed to design a ship, we find out what the requirements are, whether it is Lloyds, the Department of Commerce or the Republic of Honduras.

Q. Isn't it a fact that is respect of tank vessels the Department of Commerce has made regulations prohibiting the use of outlets for drawing gasoline from the engine room compartment?

Mr. Underwood:

I object to that; that is the same thing we had yesterday. I object to it on the further ground that the proper way to prove such regulation is not out of the mouth of this witness.

The Court:

Let me hear the question read.

(Preceding question read by the Reporter as above recorded.)

The Court:

Isn't that the same question we had yesterday, Mr. Matteson?

Mr. Matteson:

I think it comes in a different way, because this witness has testified as to the relative hazards between tank ves-

sels and a vessel of the type the Seminole was, so that we have a standard of comparison between them. He has also represented himself here to be a competent builder of tank vessels, and such vessels would have to be built subject to these regulations. I am asking him about his knowledge with respect to those regulations. It seems to me that this is a different question than we had before.

Mr. Underwood:

In the first place, this witness has not said that the hazard is greater on the Seminole than it would be on a tank vessel. He said precisely the reverse; in the second place, this doesn't go to the question of the witness' qualifications, because he said he has not built any tank vessels in recent years, and it is in the record that these regulations are dated 1936. On neither of these two grounds is this admissible. It calls for a comparison between two vessels of totally dissimilar construction and use. He refers to regulations not in force at the time this fire and explosion occurred. Moreover, it is a matter of proof and government regulations ought to be proved properly and not proved by this witness. It is the same thing we had yesterday when your Honor sustained our objection.

Mr. Matteson:

I am questioning this witness with respect to his knowledge of the accepted practice in a field with which he is supposed to be familiar.

The Court:

Gentlemen, I want to limit the inquiry as much as possible, in order to complete the case, but notwithstanding the desire of the Court to limit the inquiry as much as possible, I don't think the cross examination should be unduly limited. I think we ought to try to confine the inquiry as to what was required in good construction of the

Seminole, and then next inquire as to vessels of that type. We have gone considerably into other character of vessels. It may be that this has some relevancy. I am not going to sustain the objection as excluding it entirely, but I make these remarks to indicate the views of the Court. I doubt that it has much relevancy, but there is a possibility that it has, so I will let it go in. You may answer the question. Read the question.

(Preceding question read by the Reporter as above recorded.)

A. I don't know.

Q. Now, Mr. Gibbs, I think that you have testified that you make it a practice to keep abreast of the literature dealing with the field of boat building that you are particularly interested in?

A. Yes.

Q. Are you a member of the National Association of Boat Builders?

A. No.

Q. You know that organization?

A. I have been invited to join it, but it is so far away, where we can't get any benefits, that I have declined the invitation, this year in writing.

Q. What is that association?

Mr. Underwood:

I object to that; it is utterly immaterial.

Mr. Matteson:

I am developing the source of information available to this gentleman.

The Court:

All right; I will overrule the objection.

Mr. Underwood:

No; that is not the purpose of the question. It appears that the National Association of Boat Builders is a subscribing member of the National Fire Protection Association which has made some rules, and what Mr. Matteson wants this witness to do is to help him prove that the National Fire Protection Association is all right and then argue from it that the rules are all right. I don't think that this is any part of this case at all. There is a proper way of proving these things, and I don't think he should try to inject this into this case in this back-door method.

Mr. Matteson:

I will say—

The Court:

I will try to confine it.

A. Do you refer to the Association, the secretary of which is Mr. Parver, who holds the National Motorboat Show every year.

Q. I believe that is right.

A. Now read the question.

(Preceding question read by the Reporter as above recorded.)

A. It is an association of men who build boats and engines; its members are principally manufacturers of engines; not many boat builders are members of it. Its principal purpose, as I understand it, is to give a motorboat show each year as a business proposition, and charge people, who are not members of the association, for space in the show and to profit by the recipts of the association. As we have been exhibitors at the show we were asked by the secretary to join it, and we were told of the advantages relating to the dividend that we would get from the

receipts of the show. I think that our company at one time was a member, when we manufactured engines, but I am not sure of that at all. Another one of their purposes is to protect the industry against adverse legislation relating to the merchandising of products; they go for increased tariffs on engines and boats and the elimination of outside competition.

The Court:

That is just your understanding?

A. I have worked with them as a member of the committee in Washington and I have been—

Q. I don't want to interrupt you, Mr. Gibbs, but you have given us enough of description, unless you want to add something.

A. If you want the complete story I will give it to you. Now that I have gone into it I recall very definitely that that body had a meeting in Washington and called on Senator Fletcher—

The Court:

I do not think it is necessary to go into that any further.

Q. Do I understand that it was an organization that would come under the classification of a trade association in this particular trade?

A. Bounded together for largely merchandising purposes and the betterment of their business, but, as far as I have been able to detect, not for the dissemination of technical knowledge.

Q. I understand that your information with respect to problems involved in your business of boat building has come from conferences with other people engaged in the same line of business, among other things?

A. A very small part of it has come from that. I have been visited and attended various conferences called by

the government; have discussed technical problems with nearly all the branches of the government. My knowledge has come from the construction of the finest types of ships that are built, to the extent of many million dollars worth.

Q. I didn't mean to eliminate the other things that you have mentioned. You have suggested a few here. I believe you said that in the design of a gasoline propelled vessel it is not necessary to give especial attention to the ventilation of the bilges for the purpose of removing possible accumulations of gasoline fumes there?

A. I didn't mean to make any such suggestion.

Q. How would you summarize it?

A. I meant the ventilators going into the bilges, where there are holes in these bilges, under the floor boards, would not greatly increase the speed with which gasoline would dissipate, and if there were sufficient holes elsewhere—

Q. And consequently, in view of your view of it, ventilators—

A. I said non-power driven ventilation, acting on the principle of convection.

Q. In other words, you don't think it is important to have ventilators that rotate air to the bilges for that purpose?

A. No; not non-power ventilators.

Q. Do you think it is important to have power ventilators that extend to the bilges for that purpose?

A. I think that they could be of material assistance if you knew you had leaks or likelihood of leaks, a good method of protection in obviating some dangers.

Q. As I understand it, your view generally with respect to motorboats was that it was not important where you had overhead ventilation, but have either natural or power driven ventilators reaching to the bilges?

A. No, I don't say that power driven ventilators were not of material aid. I tried to convey the impression that gasoline lines could be made so well that these power

driven ventilators would have been unnecessary, and that any increase in the ventilation required for the supply of air to the engine and to the crew would not be of much effect.

Q. In other words, in the average vessel you think it is not important to have either natural or force-draft ventilators to the bilges?

A. Well, I think natural ventilation to the bilge through a cowl ventilator is possibly a dangerous thing.

Q. Would you say it was undesirable?

A. It is undesirable. That is a cowl ventilator without force-draft, you say? I think that the improper handling of a force-draft ventilator is a dangerous thing. I don't think that there is any system of ventilation that will cure the danger of a leaking system of gasoline supply, whether it be power, whether it be force-draft or whether it be natural ventilation, and I have my reasons for saying that.

Q. Can you refer us to any discussion or authority, any reputable authority, which supports your view on that point?

A. Discussions that I have had with the highest type of authorities that I know of, but I cannot refer to names; discussions with the various departments that I have dealt with, such as the Coastguard and the Army. I am almost in continuous discussion on technical details and methods developed for the design of power plants and hulls. Just whether Admiral Johnson of the Coastguard told me the things I am now telling you, or whether it was Commander Thiel or Commander Furey, I cannot say, but I can tell you that that source of information has been of great influence on me in the determination of my views on this question of ventilation, and from that source I have learned of accidents that have resulted, and changes have been made which I think will even go back into those rules and become a part of them.

Q. When I asked the question I was not referring to personal conversations with people you regard as authority; I was asking you about anything published in print anywhere that you can refer to that would support your view that natural or force-draft ventilation through ventilators leading directly to the bilges was either unnecessary or undesirable?

A. I cannot give you the date of this published account, but there is a published account of a fire and the destruction of a yacht as a result of the use of a force-fan type of ventilation. Now that was a written report; I don't know the publication or the date, but I do know that the boat was destroyed.

Q. All right; now, as I understand you, Mr. Gibbs, you make it your practice to keep yourself familiar with the literature that would cover such a subject, is that right?

A. Yes. I don't see all things, but I see a good deal of literature, and there is some of it that I don't have the time or the inclination to look at.

Q. Are you familiar with the publications of the National Fire Protection Association dealing with this subject?

A. No.

Q. Don't you think that publications of the National Fire Protection Association dealing with marine fire hazards on boats of this type would be an important thing for a man in your position at least to have knowledge of and be familiar with as a part of the learning on the subject?

A. I do not. I could read many magazines that are completely unbiased, that have no particular business, that would better give me what I need, that is, the truth; I mean facts that help me mold my judgment.

Q. Can you think of anything that would be more informative on the subject of marine fire hazards than a report of a committee of experts who had made a careful

study of the subject and made recommendations, specific recommendations, which were published by the National Fire Protection Association?

Mr. Underwood:

I object to that on the ground that it calls upon this witness to compare two indefinite things.

The Court:

He says he didn't read that literature. You can ask him why he didn't read it, and let him tell it in his own language. I will sustain the objection.

Q. Why have you not considered the publication of the National Fire Protection Association?

A. In the first place, I never had been invited to consider it; I have never seen it and I didn't know of its existence; in the second place, the marine fire underwriters I know something of and respect for a certain viewpoint. I have also worked with their branches, as stated in my qualifications, on technical matters that they are experienced with, but I am inclined to think that there are other sources that would give you much more accurate knowledge as to design. I further have the idea that people with the insurance viewpoint, dealing with methods and procedure, are inclined to tell you of methods of the past, past methods up to the time of the printing of the circular, and they are not inclined to do the research work that a man from another viewpoint than that of insurance would do. Such information as I think would be valuable to a boat builder would come from the man with the means to build a great number of boats. I can think of no greater or better source of information available to me than the naval architects of New York, the captains and operators who operate various boats of all kinds, and the purchasers of boats in government circles that I have an opportunity to confer with.

Q. Do I understand that your point of view is that an expression of opinion by an underwriter's representative is not worthy of consideration, even if only for the purpose of—

A. By no means; I think that the underwriters have in that book a lot of very sound sense, but I think I have discussed everything that i n that book, enough to fill six of these books, with men whose daily life is the development of such ships as we are now studying.

Q. I understood you to say that you had never seen this book.

A. I have never seen it, but I have it here—certain things that underwriters might ask for. I get a good deal from the manufacturers of materials. For instance, the Pyrene extinguisher—the underwriters have approved it, and it is fine, but I knew it was good three years before they approved it, and if I had gone by the underwriters books or book the ships that have been saved by Pyrene extinguishers would have been destroyed.

Q. By the same token, Mr. Gibbs, do you think that you appreciate the hazards and the necessities of this type of vessel sooner than the underwriters would?

A. I think it is entirely possible that I would. I have been given commissions, several commissions, to do things that hadn't been done before, because I was selected as a man with the knowledge and ability to do them. For instance, I built the first engine that the underwriters would ever approve for fire fighting under their label. They didn't tell me how to build it; I built it and it is in use today.

Q. Well it is your understanding then that these underwriters' views on subjects like these are inadequate, is that right?

A. I think, by the very nature of it, that they cover a period that has passed; I have seen many moving pictures of their methods, methods of fire prevention; I think

that we are not bound by their rules; our engineers are in a position to get the facts quicker than some underwriters. I don't say that is always the case, but that is my opinion. I think that where we are not bound to obey the rules, that our engineers are in a position to get the facts quicker.

Q. Well, I am not suggesting that you do not obey any rules, and I am not suggesting that you are bound by any rules, but wouldn't you consider a publication of an organization like the National Fire Protection Association, dealing with hazards of this type, a part of the literature on the subject worthy of your consideration?

A. I think it would have much of interest to me but not of greater interest than other things?

Q. Now is it your idea that the National Fire Protection Association is an underwriters' association?

A. No; it is my opinion that they operate in many ways, as the Southeastern Tariff Association, so-called, the one that operated here, but I think it is under another name; they were in the engineering department and with nothing whatever to do with underwriters except to confer with them. I think that the Underwriters subscribed to their stock, or just what the financial set up is I don't know, but that was my understanding at the time.

(Recess.)

Q. Well, do you know Mr. Luders, the head of The Luders Construction Company?

A. Oh, yes.

Q. And they are a reputable firm of yacht builders, are they not?

A. I regard Mr. Lauders as a rather eccentric person, as having a good deal of dealings with him; I know him very intimately.

Q. Do you know the firm of Henry B. Nevin at City Island, New York,—do you not?

A. I know of them; I have never met Mr. Nevin, although I think that he sells our products.

Q. They are one of the outstanding yacht builders of the country.

A. I would say that I am not familiar with his boats, to call them right offhand. I think he bears a reputation of being a good man,—that is, the firm, a good firm.

Q. And do you know Mr. L. B. Jackson, the Chief Engineer of that firm?

A. No.

Q. Do you know Mr. George F. Crouch, the Naval Architect of that firm?

A. Extremely well. I know Mr. George F. Crouch; I don't know what firm he is with.

Q. And what do you know about him?

A. I know that I gave him a commission once to design a boat for me, and I have discussed with him many technical matters relating to period vibrations in crank shafts, Diesel engines; I know what his background is.

Q. And do you know Mr. L. B. Jackson, the Chief Engineer of Fairbanks-Morse Company?

A. I think I know him; if he is the former engineer of the Gulf Refining Company.

Q. And he is a reputable engineer?

A. He has a very responsible position. I am not in position to say that he is a scientist, a good engineer; he is probably an excellent executive, if he is Chief Engineer of the Fairbanks-Morse Company.

Q. Do you remember Mr. J. L. Crone, who was the supervising inspector of steam vessels in the New York district a few years ago?

A. No.

Q. Do you know Mr. George A. Smith of the American Bureau of Shipping?

A. Well wasn't he formerly with the Bethlehem Steel, Secretary of the Marine Association.

Q. I don't know.

A. I know one Mr. Smith, and I think that is the same one, I am not sure.

Q. And he is a competent man in that field, is he not?

Mr. Underwood:
Which Mr. Smith is a competent man?

A. The Mr. Smith I know spends more of his time in organization of shipbuilders, and meetings, and sort of chamber of Commerce work as applied to this.

Q. This is the Mr. George A. Smith who is connected with the American Bureau of Shipping?

A. Well I think that would be a different man.

Q. What is the American Bureau of Shipping?

A. The American Bureau of Shipping is an association which has to do with specifications of vessels, somewhat similar to Lloyds, in the Bureau of Veritas.

Q. It is the American Classification Society, is it not?

A. I built nearly a million dollars worth of ships under them.

Q. Are you familiar with their rules?

A. With some of them. When I get a job, the American Bureau of Shipping, if the architects haven't drawn the specifications and leaves this up to me, I familiarize myself with their rules as of the date. Unless I have such a job I don't go into it.

Q. Now you say you know of no view opposed to your own with respect to this subject of bilge ventilation in the engine room in gasoline yachts?

A. I have not made such a statement.

Q. Well would you say so?

A. I don't know what other people's views are.

Q. You never have known of any opposed to those you have expressed?

A. You mean, people that differ with me?

Q. On this subject, yes.

A. Well tell me what the specific problem is, and if I know someone that does differently from the way I do, I will call his name.

Q. Well you offhand know of no one, is that it?

A. I offhand know of no one who differs with me on a technical problem?

Q. On the problem of bilge ventilation in a gasoline yacht?

A. Well I have not discussed this particular thing with Mr. Crouch, if that is what you mean, so I think that he would agree with my views, as we do agree on most things. But I cannot,—I haven't discussed it and I don't know. I have discussed with Mr. Crouch a great many engineering problems, and I think we see alike on those things.

Q. Would you accept Mr. Crouch's view on a point such as the requirements of ventilation in the bilges of a gasoline yacht?

A. If he gave me reasons; I would change my view if he gave me what I regarded as a real reason. But I am not,—would not change my view unless he did. I have thought very deeply on the matter of the movement of gases, and I have been right in most instances, even to the extent of saving people's lives,—or rather seeing them killed when my advice was not taken.

Q. Now if this pamphlet, Libelants' Exhibit 97, and the views expressed therein, were the result of joint efforts of a committee whose membership included the men I have just mentioned to you, would you consider it was entitled to considerable weight?

Mr. Underwood:
Wait a minute, may I have that question read, please?

(The question was read by the reporter.)

Mr. Underwood:
I object to that as incompetent, irrelevant and immaterial, calling for speculation.

The Court:

Now read the question again.

(The question was re-read by the Reporter.)

The Court:

No, I will have to sustain the objection to that; I think, that is your case, Mr. Matteson. I think the standard is, if you have a set of rules that Mr. Gibbs differs with, if he has testified in any detail in a different manner, that you can question him. If a set of rules adopted by a certain association on particular points, set this up, do you agree to that; or, if your answer is different, if you testified differently from that, can you explain it? You might question him about that, but I don't think that you are entitled to ask this question. I sustain the objection.

Q. The men whom I have named you would not consider underwriters' representatives, would you?

A. I don't know the conditions under which they wrote that book.

Q. I am not asking that.

A. If they were employed by the underwriters, to write it, I would say they are underwriters' representatives.

Q. As far as you know, they have no connection with underwriters?

Mr. Underwood:

I object to that as completely speculative; in proof of nothing.

The Court:

I think that is well taken.

Mr. Matteson:

I will withdraw the question.

Q. As I understand it, although you have been dealing with this subject for a long time, you never have given any consideration to the views expressed in these two pamphlets, Libelants' Exhibit 97, and the earlier edition of 1926, or the later editions of the same publication?

A. The only time I was putting regular time on the underwriters' pamphlets, was when they gave me a specific job that I was required to do to meet their specifications, and with those details I familiarized myself perfectly. I regard those things as information which can be got elsewhere quicker and less biased,—with no disrespect to the underwriters at all, but from a view other than theirs.

Q. Now I would like to come to the point of corrosion. I understand your theory with respect to corrosion in a tank which has water in it, is that the oxygen and the water have completely combined, consequently there is nothing to oxidize the iron; and where water is placed adjacent to iron it will not rust: Is that right?

A. No; there is oxygen in water; you can take it out,—I mean, free oxygen. But the water that would occur here by condensation would have oxygen in it. That is where man and most animals living in water, live,—oxygen-breathing animals. There is a limited amount, however, it is in very, very small quantity, and a layer of water,—a tank completely filled with water would show practically no rust at all.

Q. Well then do I understand a tank completely filled with water would not rust?

A. Oh, yes, but to a very small extent; that is the same water.

Q. Now what produces corrosion besides oxygen?

A. Corrosion is produced as I know it,—I mean, oxidation, corrosion is oxidation, it is sometimes called,—is produced by oxygen; a combination of oxygen with the steel, if that is the thing that you speak of as rusting. It is augmented by many things, but that is what corrosion is. We are speaking of iron, aren't we?

Q. Yes. Now condensation in a tank in the vicinity of sea water, would contain a certain amount of salt, would it not?

A. From sea water?

Q. Yes?

A. I don't think a great deal. There may be some slight amount of salt in the water.

Q. And that is indicated by such a thing as the more extensive corrosion of steel window frames or other steel objects nearer to the sea than further away, is it not?

A. Well the wind, I think that's liquid water, in most instances, where the wind actually picks up, as it did at Miami, the salt water, and carries it away. The evaporation of the salt water picks up no salt, and which comes from the ocean,—the salt water.

Q. Well in the evaporation, the water containing salt will carry some salt with it, will it not?

A. No, sir.

Q. If you wanted to distill salt water you would have to distill it two or three times to get it clear of salt, would you not?

A. If you distilled it too rapidly, you could drive over with a mechanical current into your atmosphere; but the method of making salt, or distilling water, is evaporation. Evaporators sometimes leak.

Q. Acids will extend corrosion, will they not?

A. Oh, yes.

Q. And electrolysis?

A. Yes.

Q. —will bring about corrosion?

A. Yes.

Q. And surface deposits on a steel plate will assist in corrosion, will they not?

A. Anything containing acid, would; or some things would prevent it; some things could increase it. Oil would not be—some forms of oil with sulphuric acid would not help any,—could cause corrosion.

Q. And carbon dioxide tends to cause corrosion to, does it not?

A. Well as I have stated, I am no chemist; but I do not believe that carbon dioxide would cause corrosion, unless there was some other element there to break up the carbon dioxide and to make the molecule of oxygen available for its combination with the metal. I do not think C02 would cause corrosion, although the very metal itself might break it down. It is possible, but I am not chemist enough to answer that question.

Q. Well that is a recognized hazard in connection with boiler water,—too, is it not?

A. Well it possibly is. As I say, I am not a chemist.

Q. Now as a matter of fact, iron oxide induces corrosion, does it not?—Encourages corrosion?

A. Iron oxide?

Q. Yes.

A. Iron oxide, as I know it, is corrosion,—one form of it.

Q. But when present, it tends to induce further corrosion, does it not?

A. It depends; it does at the surface of water, or between air and water, as they call it. If it remains wet and tends to suck the air in, and if it is porous, it might. I don't think that anybody knows, from what I have read of corrosion, exactly what happens; it is galvanic and chemical, and there are theories as to what does it. But one thing, the way that it is usually protected is to cover it with an impervious pigment and to keep any other oxygen from getting at it; because in order to have rust, you must have oxygen to combine with the iron, and to change the pure iron or steel, whatever it is, into a ferrous oxide, which is rust.

Q. And you would remove all of the rust, or iron oxide, before you applied such coating, would you not?

A. Not necessarily. If I could block oxygen or air from getting to it, I think the use of that as a pigment would probably be a very good thing. I have seen it done, and have seen ship operators insist on it.

Q. Now it is a fact, is it not, that rust in boilers is considered as a hazard increasing the danger of corrosion?

A. Oh, rust anywhere is a bad thing, except perhaps when it might be used as a form of a paint to be mixed with oil, to make it impervious to the entrance of—

Q. Do you know of any paint that is prepared with iron oxide?

A. I have—as I say I am not a chemist, but I have been told from time to time that one of the older and better known paints was in effect ground rust and oil; not treated by taking rust, maybe and grinding it, but by making it.

Q. What paint is that?

A. Well, I have been told it is red lead, supposed to be red lead,—by competent people.

Q. Well, red lead is a sort of lead, is it not?

A. Not as described to me.

Q. Well, you say that any kind of red lead is iron oxide?

A. That is the way it was described to me; that's what I have been taught, that red lead was, and not a lead. However that is—in dealing with paints I go to a reliable paint builder, a paint maker, and where the owner leaves that matter up to me, I in turn refer it to a reputable paint builder and get his characteristics on it.

Q. You don't of your own knowledge know of any paint that is made with iron oxide, do you?

A. Only what I have been told. I am not a paint manufacturer or chemist.

Q. Well you know that ordinary water tanks are highly subject to corrosion, do you not?

A. Well, they rust, but not very fast, when they are completely filled with water. It is when you let the oxygen in.

Q. Would you say that ordinary water tanks would last a hundred years?

A. No; it would depend upon the thickness, of course, how long they will last.

Q. What is the thickness of an ordinary steel water tank?

A. It is as high as a house.

Q. The thickness?

A. I mean by that, that the thickness of an ordinary steel water tank is determined by the diameter of the tank, and the shape; and that therefore I could not tell you what the thickness the tank would be, without knowing the size.

Q. Well an ordinary tank of a two-story house, what would be the ordinary size, thickness, of such a tank?

Mr. Underwood:

I object to that if your Honor please; the witness says he needs to know the dimensions of the tank.

Q. Well, say, 100-gallon tank?

A. Now I need to know the shape.

Q. Cylindrical?

A. What?

Q. Cylindrical, as most of them are?

A. This has to be cylindrical,—with a foot diameter and ten feet high, or six foot diameter and one foot high?

Q. Suppose you describe a typical tank then and tell us what its thickness would be?

A. I know of no typical water tanks for a house; there all kinds, they run all the way from a gasoline barrel to a cypress tank.

Q. Well what I am getting at Mr. Gibbs is just this; we all know a water tank, because we have had experi-

ence with them in our homes. Now I would like to have some standard of comparison for the durability of such a tank, and the durability of this tank on the Seminole which you say was good for a hundred years.

A. Well the tank that is used around a farm, with a two-story house, we have a windmill; that is usually made of sheet metal, galvanized. I have heard of one of those being made of metal that wasn't galvanized. If you were making that, if you did, you would make it thicker, to resist corrosion, and you might keep it painted, or put lime inside of it to block corrosion. But I know of water tanks that where at least, to my certain knowledge, are forty-two years old, and it never had any new plates in it,—right here in this house.

Q. Of course that would be fresh water entirely, wouldn't it?

A. Yes, that is drinking water.

Q. Of course there are certain acids in gasoline, are there not?

A. You could develop acid in gasoline, with other things. I am not a chemist and I don't know what the make-up of the gasoline is; but what I have learned of chemistry, elementary chemistry, that you get in my course of training, would indicate to me that the combinations do not exist as acids.

Q. And there is, I think you agreed with me this morning, an element of sulphur in gasoline,—usually present in gasoline?

A. That isn't the make-up of gasoline, that is an impurity.

Q. And sulphur tends to attack steel, does it not?

A. Sulphur, when it is capable of taking with it the other elements which would make of it acid, sulphuric acid, that would have a tendency to change the form of the iron and produce a new substance,—one of which would be rust, others would be too, most probably.

Q. And all of those things would contribute to corrosion, would they not?

A. From water,—or from gasoline?

Q. Yes?

A. If you put gasoline that was filled with sulphur, here, a very poor grade of gasoline, on account of impurities, I think its tendency would be to cause some rust.

Q. Now this matter of condensation in a tank is a continuous process, is it not?

A. Well it isn't so very continuous. If you take a very small weight of moisture, would come into the air, with your tank.

Q. Granted that, it goes in, day in and day out, and as temperatures change, does it not?

A. Yes.

Q. So that whatever it amounts to, you have your supply continuously renewed?

A. Yes, but it is almost distilled water; it is a very, very pure form of water.

Q. Yes, and water absorbs oxygen, does it not?

A. Not much. Water absorbs anything; it is a solvent of all other materials; gold, platinum, anything else; but slightly, and only very slightly.

Q. Well it is a well known fact that you can verify, is it not, that water absorbs approximately one-twentieth of its volume of oxygen?

A. I don't know that, and I don't think that is true, but I don't know; I am not a chemist.

Q. Well whatever oxygen was absorbed by this condensing of water, of course would be carried down with it until it reached the bottom of the tank, would it not?

A. Yes, but it would not necessarily rust the tank when it got there.

Q. Of course it would contribute to the supply of available oxygen?

Q. And you might set up combinations of acids which would eventually cause some part of the oxygen to con-

tribute to corrosion; but the mere fact that oxygen was in the water, does not mean that there would be any great amount of corrosion.

Q. Well as I understood you, it is oxygen that starts corrosion, primarily?

A. That is true, but it does not mean if you had a bucket of oxygen with a bucket of iron, that you will get any particular corrosion. That is a chemical process, and just how it acts I don't know.

Q. Now I think you have said that this water that would accumulate in the bottom of the tank would to a certain extent make a seal?

A. That's right.

Q. When the moisture first comes into a tank with the atmosphere that is drawn in, it usually condenses on the sides of the tank, does it not?

A. Yes, sir.

Q. And of course there is no seal against the action of the moisture on the sides of the tank, is there?

A. That's right.

Q. And there is a plentiful supply of oxygen there to assist in rusting; that is correct, is it not?

A. Yes, there is some oxygen there, and under certain conditions that would supply oxygen which is necessary to rust; but it does not follow that the oxygen goes into rust, it may go into the water, or the gasoline.

Q. Now of course it would be anticipated that the level of the liquid in these tanks would rise and fall?

A. Yes.

Q. As the gasoline was used?

A. That's right.

Q. And isn't it a fact that the area of exposure and then covering, and exposure, and covering against the steel object—

A. You mean, that is called wind and water?

Q. Wind and water; that is the point where there is usually found corrosion, is it not?

A. Yes, sir, right on the edge where it is kept damp and seems to form some kind of a batter; there is a theory that that is the galvanic action, is rapid at that point. It is only a theory, and the experts state it is thought, not known; but they know it rusts more around wind and water which is exposed to air.

Q. There would be nothing to protect the side seams of this tank against corrosion of that character, would there?

A. The element of time would protect it, and the thickness of the plate, and the weakness of the air,—of the impurities in the air.

Q. In view of that do you still say that this tank as installed on the Seminole would be good for a hundred years?

A. I do.

Q. Did you ever know a tank so installed on a boat, to last any such length of time?

A. I have never known of a—

Mr. Underwood:

I will concede that the witness isn't a hundred years old, if your Honor please.

A. Almost.—Did I ever know of such a tank a hundred years old?

Q. Yes?

A. I have known of a good many pieces of iron that are many hundreds of years old, exposed to rust and wind and water and rain, and protected by rust. History shows them, they are on exhibition today.

Q. I think that you said that this yacht that you spoke of, you were building, that you built the tanks into it so that it was built up with joiner work?

A. It is covered with joiner work.

Q. It couldn't be removed without interfering with the structure of the ship?

A. Yes, sir.

Q. Of course that was true on the Seminole, was it not? Those tanks could not be removed without removing parts of the structure of the ship?

A. I don't know what the top was, but the logical way would be, to take the deck off.

Q. Isn't it a fact that the captain's cabin was directly over the tank compartment on the Seminole, in the plan?

A. I don't know, but if it was, it would have merely been like other boats.

Q. That is the only way that you can suggest that these tanks could have been removed, is through the top of that compartment, is that right?

A. Oh, no, those tanks as I saw it, could have been moved by unbolting that bulkhead. As I remember it, that bulkhead was bolted together, the bulkhead facing the engine room; I may be mistaken, but whether that was so or not, you could have cut those rivets and taken that out. I think that may have been the easiest way to do it.

Q. You would have to remove that bulkhead, would you not?

A. Yes, you would have to remove one of the walls to let your tank out. I see bolts here, but it would seem to me that—and there were evidently bolts here.

Q. Well the testimony is that the single plate in the middle was fastened by bolts, and I believe that the rest was riveted.

A. Well I don't know the size of those, but I judge, —it occurred to me at the time that that was left bolted up, just like a door,—a temporary door, to pull that out and take those tanks out if you wanted to.

Q. Now I call your attention to this, the opening from the number two tank is exactly at the left hand edge of the bulkhead, and of the number three tank is exactly at the right hand edge. In other words, the plate covers the distance from the middle of the number two tank to

the middle of the number three tank. Now considering the closeness with which those tanks were spaced in that compartment, you wouldn't be able to take them out through that opening, even though they were removed?

A. No, you are quite right about that.

Q. And if the bulkhead were taken out, you would have to remove the batteries and the shelves that were attached to it?

A. It might be.

Q. And the auxiliaries that were immediately in front of it, would you not?

A. It might be. But on the assumption that what you say is true, the removal of that would not have assisted greatly; you would have to open another seam, to give you the least trouble from the tank; and then I am not sure that it could be done, because I don't know how they were fastened in the top; it may be they were fastened there where they couldn't pull outside.

Q. Well of course it would be impossible to fasten that bulkhead in place with the tanks in place, would it not? That is you wouldn't be able to get inside of the tank—

A. If it is riveted; you can re-rivet the tanks from the inside.

Q. The bulkhead?

A. The bulkhead, from the inside. It would be a difficult thing. That was probably done, and the tanks probably slipped in through the top when it was built.

Q. That is the only practical way that you see, is through the top of the compartment, is that right?

A. That's what it would appear.

Q. Now there is one thing that you spoke of as an atrocious practice; that is the practice of drawing off gasoline in the engine room through the bowl or through the connection on the bowl of the carburetor?

A. You mean, by breaking the line?

Q. Well my impression was that you referred to some adjustment on the carburetor, through which gasoline could be obtained; but whatever it was, you tell us?

A. Well in the absence of a source of gasoline for any one of the many purposes that it is used in an engine room, it is quite common practice to take a wrench and open up the union, and then let the gasoline come out of the line into a cup, or onto a sponge or a rag. And I have been on a great many ships where a little gasoline was needed, to wash the dirt off your hands; "Wait a minute, I will give it to you, just a moment"; and he would reach down and open up the line, and, "Here", hand you a rag; I would wipe off my hands, hand him back the rag. He tightens up the cup. A thing you would see on a great many ships in this harbor, where the unions were pretty well worn from that practice.

Q. Now you describe that as an atrocious practice?

A. I do.

Q. Why do you consider it an atrocious practice?

A. Because it is not known at that time how well those unions are made up; and unions are not made for that kind of use, unions are made to be put together, a few times in the life of the union. They are not a valve.

Q. Well what would the hazard involved, be?

A. The hazard involved would be that the union wouldn't be made up tight; that he might have a small wrench to do it with, instead of the larger wrench; and it would further be the hazard of requiring maybe one man to tighten it, while the other man took the oil out,—and the division of responsibility.

Q. And would there be the hazard of spillage and leakage of the gasoline?

A. There would be the hazard of—usually you spill a whole lot of gas when you wet your rag or put it into a can; and every time you do it, you jerk your joints;

you usually lift it up; it is down here, and you lift it up until you can get it under the cup.

Q. Do you consider that spillage of gasoline a hazard?

A. I consider the wilful, I mean the running of gasoline in a stream, out in the boat, is a thing that should not be done. I think that any leakage in an engine room is a bad thing, at all.

Q. And you consider drawing gasoline in the engine room—

A. I don't call that leakage.

(Thereuon, at 5:03 o'clock the hearing was recessed until 9:15 o'clock A. M., of the following day, to-wit, November 16, 1939.)

Thursday, November 16, 1939, 9:27 o'clock A. M.

Hearing was resumed pursuant to adjournment of the previous day; the witness, MR. GEORGE W. GIBBS, was recalled and further testified as follows upon continued

Cross Examination.

By Mr. Matteson:

Q. Mr. Gibbs, the coolest part of a vessel is usually the bilge, is it not?

A. Not always.

Q. Well I mean, the average conditions, that is true, is it not?

A. No, I have known them to be very hot.

Q. I am talking about the lower part of the ship, in contact with the water; that is ordinarily the cooler part of the ship, is it not?

A. Depending upon the construction of the ship, whether it was wood, or steel; and the rate of transfer

of heat out of the bilge into the water, if the water be colder than the ship. It is quite possible for the water to be very much hotter than the inside of the ship; you can have a temperature considerably higher than the ship.

Q. In southern waters it is usual that the air is warmer than the water, is it not?

A. Warmer?

Q. Yes?

A. Sometimes it is and sometimes it isn't. That is what makes the wind,—sea breeze one time and land breeze another; one at night, and the other in the day.

Q. Well the wind is dependent on the variations in temperature of the air, is it not?

A. The winds along shore are dependent upon the difference in temperatures on the shore and the ocean. If the ocean is cold, those airs that are cold over the ocean, they settle, and the hot airs on the land rise, and there is a circle there, and it is reversed, depending upon whether it is night or day; at least that is the theory of Dr. Manfried.

Q. It is the difference in temperature,—the air, not the water, that makes the wind?

A. Well that temperature of the air is caused by the water.

Q. Well perhaps that may be so, that the temperature of the air is to some extent affected by the water,—the land that it is over; but it is temperature of the air that makes the wind?

A. Over a hot building, for instance, the air is heated and gradually rises, and then that causes the wind to flow, to fill the gap, caused by the rising of the hot air; and wind is caused by these convection currents, which of course affect the temperature.

Q. Won't you concede that under ordinary circumstances, the lower part of the hull of a ship, that is in contact with the water, in this climate, is cooler usually than the upper part of the ship?

A. It would depend largely upon the time of the year. I have never actually gauged that, but I have known of a very cold ship, especially if she is still, in a very warm current, right here in this section, the water was very hot and the air was extremely cold.

Q. Perhaps you will go as far as this with me, that at times at least the lower part of the hull of the ship, the bilge, is the coldest part of the ship?

A. I think unquestionably that there are such times.

Q. I have turned to this article that you referred me to on convection, in the Americana Encyclopedia. I notice it begins,—when the air in contact with a hot stove becomes warm, it expands and grows lighter than other air, owing to unbalanced forces the hot air rises to the ceiling and then spreads out to the walls, where it becomes cool, and thereafter contracts and becomes dense.— You don't suggest that the bilge of a ship is like a hot stove, do you?

A. No. It is to the extent that there is a different temperature; it is a difference of temperatures that causes the convection. It might be relatively like a hot stove.

Q. Well now if the bottom of the ship was actually cooler than the upper part of the ship, then you wouldn't have any convection of air, gas from the lower part of the ship to the other, would you?

A. Oh, if it was cooler?

Q. Yes?

A. If it was just one plate, and they had absolute uniform temperatures, with no extraneous forces, you would have no motion.

Q. And if it was cooler, you would have no motion, because cold air would stay at the bottom; isn't that true?

A. The tendency of cold air at the bottom and hot air at the top, would greatly retard convection, to some extent. For instance, if your floor was a hot stove, your

plate was a hot stove,—I mean, a cold plate, and if your ceiling was a hot stove, your tendency there would be a tendency to retard the convection?

Q. You admit that it would be retarded under such circumstances?

A. That would be the tendency, yes.

Q. Now it would, as a matter of fact, in the absence of extraneous forces such as you were talking about, stop it completely, wouldn't it?

A. Assuming a homogeneous temperature, without baffles or plate, the hypothetical situation of that kind, I say would retard it.

Q. I am talking now just purely from the theory of convection. Of course there may be other things, such as induced ventilation and so forth, but I am just talking about the theory of convection alone. In constructing a ship you have got to anticipate that there will be times at least when the forces, conditions, will be such that the forces of convection will not operate at all, haven't you? Or at least, as you say, be greatly retarded?

A. We would have to consider practical observation, and if one happened to know that at no time had air apparently,—or gas apparently been still, you could practically eliminate the thought of that theoretical condition, where convection didn't set in. One would realize that they had never seen smoke, for instance, stand still, regardless of how quiet the room was,—the uniform temperature. We would be forced though to think that theoretical conditions would never exist.

Q. Of course when you see smoke, you know it is coming from a hot stove or fire, don't you?

A. And therefore you would think it would rise, but it don't, it falls, in most instances,—many instances.

Q. Now I read you one sentence from this article on convention; I would like to have you call my attention to

anything else that you consider bears on the subject of ventilation, in the article?

A. It is a short article; will you read it to me, or someone lend me your glasses?

Mr. Botts:

Here are some; they are bi-focals; can you read with those lower lenses?

A. Shall I read it out loud?

(By Mr. Matteson):

Q. I don't care about your reading the whole thing, but you may if you wish. I asked you to point out anything in it that you considered pertinent to the subject of ventilation?

A. I can tell you from memory; there is another example given of convection in the handling of liquids.

Q. Well let's see if I can find that?

A. It is in the second paragraph.

Q. Is this the sentence: Convection phenomena also occur in liquids. A large vessel of water supplied with heat, at one side of the bottom becomes, through the action of convection currents, uniformly heated throughout.—Is that what you have in mind?

A. That is the sentence of interest in this matter.

Q. Well there is nothing in this article at all about ventilation, is there?

A. It is the entire basis of ventilation. It is as important to ventilation as friction is to the design of machines. It is the background of all ventilation,—the ABC's of it. As illustrated in this second paragraph, when you discuss water, the slightest change in temperature of water will cause rapid convection, or motion and movement. Bear this in mind, a slight change in temperature of water, one degree for instance, does not increase the volume of the water. 1/195th, or one gallon

in 500, as it does with other gas. It increases its volume practically nothing,—an infinitesimal amount. Yet with that tiny decrease in specific gravity, due to the expansion of the water by almost nothing, but with the variation so slight that one cubic foot of water weighs practically nothing less than the other, we will say a 20th part of an ounce in 100 pounds; and that difference of temperature in a fluid,—and a gas, and a liquid or both fluids, causes the theory of convection that would let a bit of litmus here show up over there in a tank, in a remarkably small time. All ventilation is based very largely on the theory brought out in this short article. It is a theory known to me since I was in college; brought back to me attention in many discussions with people on ventilation. And I regard that as a very splendid definition of the basic laws which are extremely important in the study of ventilation.

Q. Now I asked you yesterday, Mr. Gibbs, and I ask you again now, if you can refer us to any authority which supports the view that the theory of convection will be adequate to exhaust from a room or compartment, gases that are heavier than air?

Mr. Underwood:

If your Honor please, I think we have been over all that once.

The Court:

Well we won't go into it extensively; it is repetition, though Mr. Matteson. If we can save more time, let the question be answered.

A. I know—can recall no authority who has, or which has specifically expounded the theory which I have expounded. I wish to say however that this failure on my part to recall this authority, is just as my failure to

give you other specific information where I did not bother to remember just what engineer had discussed the matter with me.

Q. Now we will leave that subject for the time being.

Mr. Botts:

If the Court please, it seems to me that, since the witness gave this as his authority, and the sole authority for his theory, that it would be appropriate to have that article, not read now, but to copy it into the record; because he gave that as the basis for his authority, and it is the only one he has given.

Mr. Underwood:

If your Honor please, it is just another example of one's inaccurate memory. The witness made no such statement, and it does not appear in this record. What he said, was, I called it to his attention after he had given me his views about convection. I don't have any objection at all to putting this piece in the record if Mr. Botts wants it there, but I don't think it ought to go in on that basis, because that is not the true basis.

The Court:

It is open here if anybody wishes to examine it.

Mr. Botts:

If he gave any authority, I don't recall it. If it is agreeable, we will have that photostated and filed.

Mr. Underwood:

I have no objection, just so you get the book back to Mr. Anderson.

Mr. Matteson:

If there is no objection, let the stenographer assign a number to it, and we will furnish the photostat copies as soon as it can be arranged.

Mr. Underwood:
You are offering that now, and giving it a number?

Mr. Matteson:
Yes.

(Thereupon the said encyclopedia excerpt, to be substituted by photostat thereof, was admitted in evidence and filed as Libelants' Exhibit No. 138.)

(By Mr. Matteson):
Q. Now Mr. Gibbs, I think in referring to these gasoline tanks on the Seminole, you said that you considered that they were built for some other purpose than the storage of gasoline. What did you have in mind with respect to that?

A. I had in mind that the thickness of the plates suggested pressures far in excess of the pressures that were required for this job. It is an opinion based on the thickness of a great many plate tanks that I knew of.

Q. What more strenuous purpose do you have in mind that it could be used for?

A. I could have any one of a thousand uses requiring great pressures.

Q. Well, name one of them?

A. A water tank with the pneumatic system, for instance.

Mr. Botts:
You mean what is known as a pressure tank?

A. It is known as a pneumatic system tank. You put air in one end of a tank and water is in the bottom.

Mr. Botts:
But the air is then put under a pressure?

A. Yes, sir; sometimes you put a pump, and sometimes it is occluded with the suction in the water. That is a

tank that requires tremendous strength and tightness; and I have seen such a tank as that, used for the purpose.

(By Mr. Matteson):

Q. In other words you think it would be suitable for an air pressure tank?

A. That's one of the uses. That is one of the most terrific services that a tank can be called upon to do, is to serve in that particular purpose. Of course there are literally thousands of others. You asked me to name one.

Q. And if it were used for such a purpose, how would you make it tight against the terrific air pressures that you are talking about?

A. Against what?

Q. Against the heavy air pressures that you are talking about?

A. Well they are made to be right, by the close spacing of rivets, and the heaviness of the plates.

Q. Isn't it a fact that the air pressure tanks are double riveted?

A. It would depend entirely upon the pressure that you would operate under. It would vary back to the place where you sacrificed tightness for strength. Those systems usually operate at around 62—well a maximum of 60 pounds; equivalent to most city pressures.

Q. Well would you approve such a tank for air without welding or caulking?

A. Most assuredly,—when you say without caulking, I would permit caulking when the tanks were tested, as is usual with a riveted tank; but I would insist on hydrostatic pressure, which these tanks are put under, which guarantees their tightness under pressures far in excess of working pressures. When I had it inspected on that basis, I would be satisfied.

Q. How long, in your opinion, should a hydrostatic test be applied, to be effective?

A. I would be satisfied with a hydrostatic test of an hour. We actually in our work use a longer time than that; as a matter of fact I would be satisfied with five minutes.

Q. As a matter of fact, in your practice, how long a time do you use?

A. It depends upon the instructions of the people who employ us. They may ask us to leave it on for twenty-four hours, or thirty-six.

Q. That would not be unusual, would it?

A. What is that?

Q. Twenty-four to thirty-six would not be unusual test?

A. I would think so. I can conceive of no reason for a much longer test, a hydrostatic test.

Q. What would you say was the usual length of time?

A. I would say there is no such thing that I am familiar with.

Q. All right. Now do I understand you to say that caulking is only used when leaks have been discovered?

A. No, I wouldn't say that.

Q. Well that is the way I understood it yesterday. Do tanks of this type ordinarily some caulked?

A. Not necessarily. It would depend somewhat on the design of the tank. But what I said yesterday was that tanks under test are often caulked at the point where seepage appears, even with the fluid inside of them, under the hydrostatic test, and only there.

Q. Well as a matter of fact, isn't it a fact that standard tanks for the storage of fuel oil and gasoline, usually come either riveted and caulked, or riveted and welded?

A. A great many tanks do come welded. In fact that is the popular way to make tanks today, because welding is quite accurate; is advanced. Just a few years ago a good engineer wouldn't think of accepting a welded tank, he demanded a riveted tank, at a high price.

Q. Well my question was, Mr. Gibbs, isn't it a fact, as far as you know, that tanks of this type, for the storage of fuel oil or gasoline, are either riveted and welded, or riveted and caulked, and come that way?

A. It is not a fact.

Q. And that is true today, is it?

A. Did you say, usually come?

Q. Yes?

A. It is true today.

Q. What?

A. It is true today.

Q. It is true today that they do not actually come that way?

A. Well I don't say that they would not, in the test. Now the important thing is the test, and if they develop a weakness anywhere, that weakness is repaired. I would think caulking would be the way that it is usually done. I haven't seen all the tanks in the world, but under my observation, the tanks that I have seen, are not usually welded or caulked; perhaps 80 per cent of all the tanks today are welded tanks, but that didn't apply just a few years ago.

Q. Well now I am making it double-barreled; either eliminate welding, and call it caulking. You say that it is not customary for tanks of this type to be supplied by the manufacturer in one way or the other, either welded or caulked?

A. I didn't say it wasn't customary. I said that—tried to say that it wasn't the universal rule; that they could be caulked, they could be welded; there would be various opinions on it.

Q. Do you make tanks in your own yard?

A. Yes, sir.

Q. Now about these tanks on the Seminole, you observed one of them when we were out there in October. Did you see any evidence of caulking on the outside of that tank?

A. I saw the—my observation of the heads would indicate that there was plenty of room for a caulking iron, and that they might have been caulked.

Q. Well if they were caulked, you would certainly be able to see it, would you not?

A. You would not.

Q. Well caulking is a surface operation, is it not?

A. But the surface operation at the bottom of a crack, can't be observed by looking directly over it, where there is a general corrosion of the water or the mud or the stuff that was on those tanks. A microscope, by cleaning that out, or sawing that section away, would show us; but there was no evidence to me that they were not caulked in the heads, that particular place that was pointed out. I can draw a picture and show you.

Q. I particularly called your attention, in the presence of the Court—

A. Exactly.

Q. To the head of the tank?

A. They said this wasn't caulked, and I looked and made a mental note that it might have been; because there was lots of room to put a caulking iron there.

Q. You didn't say so at the time, did you?

A. I wasn't asked to say so.

Q. Don't you remember that when it was called to your attention that there was no evidence of caulking on the outside, you borrowed this man's glasses to look at it, and your reply was, well you can't say that they are not caulked on the inside?

A. No, I don't recall any such thing; if I borrowed his glasses to look at it, and did make a remark, I think was that you—in fact I know that it was, you can't say that it was caulked there.

Q. Now of course that would apply to the top of the tank. Now at the bottom of the tank—

A. That was one of the spots under consideration.

Q. Of course we will concede that you couldn't see the inner edge of the seam at the top of the tank. At the bottom of the tank you can see both edges of the metal, can you not?

A. Yes.

Q. And it would be impossible for that seam to be caulked on the inside?

A. I would not—you mean from the outside?

Q. From the inside; I mean, it would be impossible?

A. Harder.

Q. —to be caulked from the inside?

A. Yes, you are right there.

Q. And you could not observe or call to the attention of any of those present, any evidence of caulking on the lower seam, could you?

A. I saw no evidence that there was no caulking.

Q. Well now when caulking is done, a section of the metal is separated and pressed away from the main body, is it not?

A. Not necessarily.

Q. And part of the edge that is originally there, is destroyed and pressed away from its position, is it not?

A. Not necessarily; the metal—the whole bit of metal is compressed, causing the two pieces to adhere closely, rather than to have them apart. But you don't have to separate them in order to mash the metal in,—to draw them tight.

Q. And you mean to say that you can look at a tank and not be able to tell whether it is caulked or not?

A. I am putting it backwards; I say it is most difficult to look at a tank and say that it wasn't caulked.

Q. Now when a rivet is removed from a piece of work, and replaced, isn't it a fact that the hole is usually reamed out, and a larger rivet put in its place?

A. Well not always. We remove a great many rivets now with acetylene, and we simply touch the center of

it, and it practically collapses under the heat; we confine our destruction to the center of the rivet, in a small rivet.

Q. Don't you recognize that it is a good practice to cut the hole out after that has been done?

A. Not unless the hole is injured, and when you pierce the shank of the rivets, the heads fall off; or you could just tap them and they come off. That is the way rivets are commonly removed.

Q. You say it is common practice in your yard to restore rivets of the original size, after rivets has been removed in one way or another?

A. Depending entirely upon the place it is being used. If we were putting a Scotch boiler, with very high pressure, subject to terrific stresses or service, we probably would examine it, and if necessary make it an electric job. But I can see no reason whatever to change the size of rivets unless the holes are injured; and we don't do it in our yard unless ordered to do so by the man employing us.

Q. Would you put back a rivet without reaming out the hole, in a gasoline tank?

A. I can see no reason why you wouldn't, unless the hole was injured.

Q. It would be very difficult to get a rivet out without injuring the hole, would it not?

A. I don't see where there would be any difficulty to it at all.

Q. Now with respect to the bracing of the tanks; these wood separators were between 1 and 2, 2 and 3, and 3 and 4 tanks, were they not?

A. I saw it between two tanks, and I assumed that that was the method of bracing the tanks.

Q. They act as separators; they come between; is that right?

A. They act as locks to the tanks, to practically tie the four tanks,—assuming that what I saw here, and I

couldn't see anything that was burned,—was that this construction was carried through; the whole process would have served as a lock, locking the four tanks, if it ran across the four, making a unit out of the system.

Q. You spoke of there being no objection to there being wood, as foundation of the tanks. Were you assuming in that that the tanks would not leak,—did not leak?

A. No, I didn't take that into consideration at the time—that any leakage that might come on the wood. I have seen a great many tanks installed on wood; nearly all of them are in wooden ships; and I could see no objection to the wood there, regardless of whether they leaked or not. Of course I didn't figure on them leaking, but if there had been a tank that definitely did leak, I wouldn't change the wood there.

Q. You would not have changed it?

A. No.

Q. How was this ship stiffened, fore and aft, as to her structure? Can you tell me that?

A. I have no idea, but I paid very little attention to that; I mean, I wasn't asked to observe that. Just generally speaking it was sort of it—struck me that an examination would have shown it was partly Isherwood system; I mean by that, that it seemed to have fore and aft stringers treated as a beam.

Q. You refer to the—

A. Very small resemblance.

Q. You refer to the port and starboard deck stringers along the side?

A. What is that?

Q. Refer to the port and starboard deck stringers along the side?

A. No, I refer to the scantlings that run fore and aft on the ship. I just have a hazy recollection of seeing shelves, stringers, and things like that, seemed to me to be ample, but I didn't go into that at all.

Q. Did the ship have any center line girder?

A. I didn't observe any part of that.

Q. Did she have any keelsons?

A. I made no observation as to that.

Q. That would have a great deal to do with whether the ship was stiff or whether she had movement in her structure in a seaway, would they not?

A. The strength of the ship?

Q. Yes.

A. I might have been asked to do that, but I wasn't.

Q. If the ship has considerable movement in her structure in a seaway, that of course will place considerable strain on her fittings, will it not?

A. It would depend entirely on how the fittings are placed, the length of them; if it is in a section of the ship with no flexure it wouldn't have much. I would simply state that I might have hunted for these strength members, which I saw some of them, which were apparent. Were it not for the fact that the ship was of deep girth, and of steel, and there is almost no movement in a steel ship,—the ones I have seen, with the short length and her girth:

Q. You would say she would have no—

A. —deep molded depth, instead of girth.

Q. You would say she would have no movement in her structure?

A. I think the movement would have been inappreciable from the standpoint of causing distortion to any inside equipment.

Q. If there were some such motion, it would tend to put a strain on her connections, between her gasoline tanks, her feed lines and her engines, would it not?

A. I wouldn't say so in the Seminole, because the stuff was all right together. If the tanks was in the extreme bow, and the other equipment was at a place where there was actual variation from the alignment,—

a straight line, for instance, and a distance from a straight line, there might have been some tendency for a strain. But that was not the case here.

Q. It is a fact is it not that if the ship has a tendency to have a movement in her hull due to lack of stiffness, amidships is the point where that will be most apparent?

A. Oh, no. It would be most apparent in what is called the point of greatest flexure. You may have a perfectly straight line in the area of the engine room, and the whole bow and stern can go up and down, and if your staff is concentrated around the engine room there is no need of any strain. However, that steel hull, as I observed it, permitted of no vibration of the hull or machinery at all. It was easily much stronger than any wooden hull I have ever seen in my life.

Q. I think you said that in designing a vessel you did not need to take into account the possibility that pipe line connections might vibrate or work loose on the gasoline lines, and that you have known many vessels that have never had a wrench placed to their pipe lines, in their lifetimo; is that right?

A. No, sir, that is not right.

Q. Well tell me what your view on that is?

A. I said that those—in the design of a vessel, that those materials were put in in a way that they would give no trouble, with a very distinct appreciation of the fact that improperly installed they might give trouble; and that there were no secrets as to what you had to do to make it permanent and sound; and when you didn't do it you simply didn't obey what would be indicated by proper design.

Q. Then I think we are on common ground. Then if you had a vessel where you had frequent trouble from pipe lines coming through,—coming loose and leaking through vibration, you would consider that the pipe lines were not properly installed, is that right?

A. Why I would have to know what was the cause of that trouble.

Q. Well I think you just said that there was no secret or difficulty about designing a vessel so you would eliminate that trouble?

A. That is quite true, sir.

Q. Then if that condition exists, it follows that she hasn't been properly designed and put together; is that right?

A. No, that would not follow.

Q. Well what does follow?

A. It would follow that certain things might have happened, to take a perfectly good, sound job and injure it. For instance, sabotage might set in there. A man—lazy operator, might break a line in order to secure gasoline. If he did such a thing it would probably be the wise thing to put a cut-off line in the engine room so that it would not be at the mercy of his disobedience to your instructions.

Q. You spoke of the hazard of breaking a pipe line to draw off gasoline in the engine room; and you do consider that a serious hazard, as I understand it?

A. Yes, I think that is a dangerous practice.

Q. And the danger is the possibility of leakage of raw gasoline into the engine room, is it not?

A. That is right.

Q. Now what would you say of the practice of attaching a rubber hose to a—we will say this draw-off valve that was in the engine room of the Seminole, and flowing the gasoline out through the hose, through a window that was higher than the cut-off valve, which of course made it necessary, when the operation was discontinued, to break the line by detaching the rubber hose at the valve; would you say that was also an atrocious practice?

A. Why, no; there is no difficulty at all to bringing that hose in and completely emptying that gasoline out,

without putting any part of it into the engine room. I suppose you mean that he pulls it apart and lets what gas is in the hose, run down into the boat. That is unnecessary, and it isn't done by even boys, that I have seen filling gas with a hose.

Q. How would you do it?

A. I would—when I ran the hose into the tank, or wherever it was outside of the ship, I would seal it, the end of the hose, with my thumb, and then I would bring that end of the hose right back to the cut-off place where it is fastened; I would put the two pieces together, and I would draw them down like that, and then I would take them out of the engine room. You wouldn't have to take the hose into the engine room; I would hand the two ends out of the window, and I would either put it in the tank of the small boat that I was filling, or drop it overboard. But I would not waste it; it is not a whole lot, but I would simply take one end into the tank of the boat that I was filling, remove my thumb, and carry it in.

Q. And you think as a practical matter that you could perform that operation without spilling any gasoline at all in the engine room?

A. I have done similar things repeatedly, getting gasoline from my automobile for my wife; in lending gasoline to people.

Q. And you think that is an entirely different matter than breaking a gasoline connection on a copper pipe, and keeping your thumb over it to prevent a leak?

A. The great danger with that,—breaking a line, is of course the fact that you have no vessel you can stick under it, and you may reach the frying pan, but usually the vessel available is something like a coffee can; and when you break that coupling you lift the pipe up high, you strain the fittings, and then you get your gas, and perhaps you have,—of course you are putting it into a

very wide, open can, to start with, where you have some gas fumes come off. You put it back and tighten up your coupling, and if you have the right sized wrench you tighten it up tight; if you haven't got the right sized wrench you perhaps don't. But you make a very improper use of a union. If you are going to do that, you would provide a valve, and when that operation is repeated there is going to be one time when you don't draw up your connections tight enough, in which event you will have a continuous leak. Of course you wear the parts every time you do it, and have an awful good chance to burr it.

Q. The difficulty, I take it, with respect to breaking the pipe, is that someone would be negligent in doing it?

A. The most careful man, that deliberately twists a whole pipe line, is going to injure that, regardless of whether he is negligent or not. But even the best man can't make up a coupling continuously over a period of years, without injuring the—wearing the threads and wearing the faces of the union.

Q. Well now this practice which you have described as atrocious, results, as I understand it, in a hazard of spilling gasoline on the floor or into the bilges, which will evaporate there and form gas, gas fumes, which are dangerous; is that correct?

A. That practice would result in a possibility of a continuous stream of gasoline into the bilges from a line that may have crystallized and parted; or from a very serious injury to another portion of the pipe line.

Q. You suggested at one stage of your testimony that the engines of the Seminole might be washed with gasoline. Would you approve of such a practice?

A. Well that has always been done and I approve it as a necessary, practical thing to do; a thing that can be done with safety if the danger is recognized, which it is, with such an engineer as you could hire, and probably did, for this type of vessel.

Q. I see. Well, the gasoline used for washing the engine of course would evaporate very promptly, would it not?

A. That is one of the purposes of its properties; that is required for washing.

Q. Exactly, the tendency of the gasoline fumes so released, would be to fall into the bilges, would it not?

A. At the time of the washing,—which, by the way, is usually in a machine shop, once a year. You don't wash engines like you wash your face. The washing, Mr. Matteson, refers to the washing of a part that has been taken out, and it has gotten grit all over it, and you wash it and oil it before you replace it, in order to keep grit out of the inside of the engine.

Q. Well weren't you referring to the use of a sponge with gasoline to mop off the exterior of the engine and clear it up?

A. Oh, no, sir; no, sir.

Q. You didn't refer to that, when you were speaking of washing?

A. Why certainly not. I referred to the proper operation of the engine.

Q. Now can you tell us, Mr. Gibbs, by reference to any standard work, or, of your own knowledge, what the relation is between liquid gasoline and gasoline vapor, as to volume? If you want to refer to Kent on the subject, I think I have the place?

A. Could you postpone that until I get my own glasses? I can't see with those.

The Court:

Try mine.

A. I can tell you, for any purpose that you wish.

Q. At 32 degrees, it is 22.3 cubic feet per gallon according to the figure that I reach here?

A. Thirty-two degrees, that is the temperature of the—standard temperature of freezing; is what?

Q. 3.6 per cubic feet per pound; 22.3 cubic feet per gallon?

A. 23 pounds a gallon? Is that the weight of it?

Q. No, 23 cubic feet per gallon.

Mr. Botts:

That is 23 cubic feet of what?

A. That is absurd.

Mr. Underwood:

Just a minute, let me read this.

A. Mr. Matteson, if you give me the weight of a cubic foot of one and of the other, that is all I want to know.

Mr. Underwood:

Do you want to put in the record what Mr. Kent says, or do you want to take Mr. Gibbs' word?

Mr. Matteson:

I don't care about Mr. Gibbs.

Mr. Underwood:

Just read this into the record from page 4-61 of Kent's Mechanical Engineers Handbook, entitled Power, 1936. It says, "Typical significant properties of gasoline are, volume as vapor at 32 degrees Fahrenheit .760 mm, 3.6 cubic feet per pound, 22.3 cubic feet per gallon; air required for combustion of one pound of gasoline, 15.3 pounds."—Do you want any more?

Mr. Matteson:

No, sir.—Your Honor, we have just read into the record the relationship between liquid and gas.

Mr. Botts:

Did you hear what it was?

The Court:

No, sir.

Mr. Matteson:

It is 22.3 cubic per gallon of liquid gasoline.

The Court:

Let me see if I catch that; just read what was read into the record, Mr. Bryant.

(The foregoing quoted excerpt was read by the reporter.)

(By Mr. Matteson):

Q. Now I want to ask you a question or two about this safety can; what is your objection to this?

A. My experience has shown that these things are not practical,—a flexible tube.

Q. Of course that could be eliminated entirely, could it not?

A. You mean, someone could invent a new one?

Q. No; cut it off with a hack saw, if you didn't want it?

A. Oh, that is a suggestion; but whether—

Q. I mean that is not an essential part of the arrangement, is it?

A. A man buying it, he doesn't know what is essential. It may be a very ingenious thought; I don't know whether an engineer would have it. And besides, an engineer would think this was all right. I know that it isn't.

Q. Well it would be all right until it wore out, wouldn't it?

A. It does not immediately snap off. It ruptures right in here, and the tiniest little bit, and then it leaks, out here.

Q. Of course the only time there would be any gasoline in this flexible tube that you are speaking of would

be at the time there was actually gasoline being poured out of the can; that is right, is it not?

A. Of course.

Q. ~~That is right?~~

A. What is that?

Q. The only time you would have any liquid gasoline or any other kind of gasoline in this flexible tube, would be when you are pouring out?

A. No, you might pour it out like that, see, and immediately drop it like that, and it is full of gasoline.

Q. Of course it will run immediately back into the tank, will it not?

A. It probably would. It might be like that, and it wouldn't run into the tank; then that wouldn't run into the tank, none of it, and you might twist it.

Q. If it were used as it was intended, it would be placed on its base and the gasoline would run back into the tank, and then you would put this across in the socket it is intended to be placed in, would you not?

A. Of course, the suggestion that this be cut of, might be considered a fine thing. If you cut it you would leave it off. There would be no suggestion to bring it back and lock it; that is why this length is put there, probably. But do you know whether there is any gauze in here?

Q. No; but there is a valve that closes when the outlet is turned around, it shuts off from the tank, does it not?

A. Do you know if, while handling this gasoline in the engine room, it would spark, or anything happening to hit that vent before he turns it off, that conflagration may set in and destroy the ship,—that this thing is in effect a bomb, infinitely more dangerous than that?

Mr. Underwood:

Referring to the draw-off valve?

A. Referring to that can.

Mr. Underwood:

I am sorry; the can; excuse me.

Q. Do you regard the can as a bomb?

A. No, not in any way.

Q. I am referring to the filling can?

A. That can is in no way a bomb, compared to this.

Q. Why not?

A. You build no pressure in there. I have repeatedly dropped a match in an engine cylinder and had the explosion, just simply a very gentle explosion, which would occur in that. In this however, the minute your pressure started to build, you would compound the effects of your explosion, and such a thing might wreck this room.

Mr. Underwood:

When the witness said "that", he referred to Libelants' Exhibit 13; when he said "this", he referred to Libelants' Exhibit 137.

(By Mr. Matteson):

Q. Now I think you told me yesterday, Mr. Gibbs, that if there was not as much as 93 per cent of air mixed with the gasoline fumes, there was no danger of ignition at all; is that still correct?

A. There is not as much—I would say there was no danger of explosion. It is possible to burn in a plant slowly, what we know in the cylinder of an engine as inefficiently; weak explosion or slow burning.

Q. You told me yesterday, Mr. Gibbs, very specifically that in a mixture at less than 93 per cent of air in it, no ignition at all whatever would take place. Do you change that?

A. No, I mean it is possible to cause a burning, but not—a very slow burning, which I think under glass would show it probably a slow movement of a portion of the stuff,—not all of it.

Q. Now this flexible tube has a brass outlet, has it not?

A. That appears to have a brass nipple on the outside, for the sole purpose of keeping this jagged thing from cutting you. That is what is called trim.

Q. Well a brass end would not strike a spark from anything, would it?

A. Well, I never heard of brass, and metal doesn't very often.

Q. When you were referring to a spark, you were referring to some spark from some other source?

A. I was not considering a spark made by this striking.

Q. And the spark from some other source in the engine room would explode gas no matter where it came from, wouldn't it?

A. It would explode—

Q. Whether it came from this, or whether it came from something else?

A. It depends entirely upon the atmosphere that it is in.

Q. Well, isn't a fact that whether this is safe, or any other contrivance in the engine room is safe, depends upon the negligence or the carefulness of the engineer or the man who is handling it?

A. No. We often have devices that apparently are the answer to great problems, and they prove elements of great destruction; like the original forced draft ventilating systems.

Q. Well, do you think you could design a can for this purpose that would be satisfactory, Mr. Gibbs?

A. I think I could design one that would be more satisfactory than that; in fact I think I could buy one on the market that would be more satisfactory than that.

Q. And one that you would think that would be reasonably safe if carefully handled?

A. Well, I can't say that it would be safe. I say it would be more safe than that.

Q. As a matter of fact there isn't anything that is 100 per cent safe, where you have gasoline involved?

A. There is nothing in the way of a large can in an engine room, carrying gasoline, that would meet with my approval at all. I have never seen it.

Q. Now you referred to the gauge of the metal in this can, yesterday, and you referred to this rim around the bottom of the can. Do you regard that as indicating the gauge of the metal of which this can is constructed.

A. I don't think—I can't see, but this may be double here; a piece to hold the bottom in. You really ought to have a section through this. I suspect that this is a wrapped joint; but you can tell from hitting the gauge of this, and this too; I know approximately the gauge of that; this is separate from the tank.

Q. Now this bottom rim as a matter of fact is something entirely separate from the tank; it is put around the bottom for the tank to sit on as protection, is it not?

A. Certainly, and probably heavier gauge than the tank.

Q. This you realize, do you, is a seamless, welded steel tank?

A. I don't know that it is. If I had a section through it, sawed in two I could find that. Is it printed there?

Q. Yes, it is printed here; seamless welded steel, guaranteed leakproof. Do you think that label is misleading?

A. I would be inclined to think that the label is intended to be true. They say, seamless welded; it means it has seams and they welded them; and yet it has no seams.

Q. Do I understand you to say, Mr. Gibbs, that the proper way to install a gasoline tank, galvanized iron, which is cylindrical, and has one convex and one concave end, is to stand it on the concave end?

A. It is to stand it as those tanks in the Seminole were stood; as that tank there is stood, exactly like that.

When you say, concave or convex, I just want to be sure that we have our viewpoint on that.

Q. I am talking about the way the Seminole tanks were installed.

A. That is the correct way to install any cylindrical tank; the only way I have ever seen it done.

Q. The only way you have ever seen it installed?

A. Yes, any tank of that kind, except horizontally, and at angles sometimes up or down; but if it is vertical, invariably that way.

Q. You say you have seen them horizontally?

A. I say they might be. Yes, I think I have seen them horizontal.

Q. Well, of course, if you installed them horizontal, you would eliminate this crevice around the bottom that we have been talking about, where the sediment would accumulate, wouldn't you?

A. Oh, no. You would perhaps not have it at the top, but you would have it at the bottom; depends upon where you drew off, of course. If you drew completely off,—there would be a very peculiar case, to ever install a tank that way, where you had definite limitations as to the shape of the tank space.

Q. Of course these tanks could have been installed horizontally, with cradles, one above the other; couldn't they?

A. No, I don't think that would be a practical thing at all.

Q. Do I understand you to say they regard pans under such tanks, as totally unnecessary?

A. Not only totally unnecessary, but I think those pans were not pans,—I don't think they were installed as drip pans, if that is what you mean.

Q. You think it is not necessary to put pans of any kind under such tanks?

A. I certainly do think that it is unnecessary; could serve no purpose.

Q. Did you ever, in your construction of vessels, install pans under such tanks?

A. Never.

Q. Now isn't it customary in tanks of the size of this one,—of these tanks in the Seminole, when they are used for a purpose like the storage of gasoline, to have openings in their sides or ends, through which access can be had to the interior of the tank for the purpose of cleaning?

A. That would depend, Mr. Matteson, on whether you are buying a stock tank of sufficient thickness to prevent any injury to the tank by failure to clean—or rather, injury to the ship; or, whether you bought a tank of the size, for the pressure, where the thickness would be an element of corrosion—the thickness of the plate or sheets, would be an element of corrosion.

[Q.]A. Then as I understand your point of view, it is that there would be corrosion in these tanks, but you think if the thickness of the metal were such that it wouldn't go through in a hundred years?

A. I didn't say there would be corrosion of any appreciable amount. But I believe the thickness of those tanks was sufficient to let them last a hundred years. The hundred years period I meant to indicate a period vastly greater than the life of the vessel,—which might be a hundred years; I mean, the life of the tanks.

Q. Have you ever installed tanks similar to these, galvanized iron cylindrical tanks, in your vessels, with access plates on their exterior, to provide for cleaning on the inside?

A. Yes, sir.

Q. Under what circumstances did you do that?

A. When the specifications called for it; when they put them on and put them there, and we left them off. As a practical matter, it is usually that that is done in an extremely large tank, when a man actually gets in the

tank; and almost invariably they are flat tanks, which are subject to tremendously high unit pressures in the metal.

Q. You haven't seen them in cylindrical tanks no larger than those in the Seminole?

A. I have seen manhole plates in cylindrical tanks, it seems to me, of about the size of the Seminole; but not often.

Q. Those tanks are large enough to take a manhole plate, are they not?

A. You could make them with a manhole plate, but I don't think that they are stock tanks like that with manhole plates, except when very much heavier made, for other purposes.

Q. I appreciate sometimes you build vessels to specification. Do I understand that when you design—prepare the specifications yourself, you don't make such provision of an opening for the cleaning of the interior of a cylindrical galvanized iron tank?

A. We do and we don't. It depends entirely upon what the situation is at the time. If there is available a tank of very heavy metal without a manhole plate,—probably twice the metal, without the manhole plate, and others of a four or five pound tank, with the manhole plate, I could advise the owner to take the bigger tank. Of course that would mean that we had a ship like this, with ample room for the tank; that weight wasn't a factor. But a great many things enter into your decision as to what tanks to use.

Q. Well if you regarded the tank as a permanent installation for the life of the vessel, you would probably want access plates on the exterior of the cylindrical galvanized tank?

A. It would depend a great deal, with my work, as cost. I could afford to withdraw the tanks, take the heads off and examine—or without that, simply pull those

plugs out and wash them out and get—determine any sediment inside; and I have repeatedly done that,—examined tanks in that way. But it isn't—I wouldn't regard it as essential with a big, oversized tank such as that, to actually get inside of it.

Q. I am getting away from the Seminole tanks just a minute; I am asking what you do?

A. If I could get a heavy gauge tank, at a price favorable, or much cheaper than a light gauge tank, with a manhole plate in it, I would take the heavy gauge tank, in many instances.

Q. Well do I understand then that if you regarded your tank as a permanent installation, good for the life of the ship, that you would not go to the expense of providing access plates on the tank?

A. Many instances not.

Q. What instances would you do it?

A. We would do it in instances where the vessel was of a high speed nature, or one requiring the minimizing of weights, in which case we would be working on a narrower margin of strength in the tanks, and where inspection would be advised. And where I would have a boat, comparatively speaking, of unlimited displacement, a boat where weights meant nothing as to speed, I would be inclined to accept a very heavy gauge tank without a manhole plate, if there could be a substantial saving in money.

Q. Then if there was—to get back where we started, if you regarded the tanks as permanent installation, didn't require inspection, good for the life of the vessel, you would not go to the expense of providing access plates on the tank?

A. No, for the reason that the remote instance of tearing the joiner work or woodwork, in which the tanks are encased, it would be no great trick to get into the tanks, either by removal of the rivets or the opening of a hole in the tanks.

Q. Yesterday I was asking you to name some of the yachts that might be comparable in size to the Seminole, that you had built. I think you named the Fortuna; can you name any others for us?

A. We built——you mean, the exact shape of this?

Q. No; comparable size?

A. Well I guess we built a lot of boats; I would have to think back; but I recall instantly a boat larger than this boat possibly, maybe ten or fifteen feet, but the "Colonel", for Col. E. H. R. Greene of Miami.

Q. What was the name of that vessel?

A. She was not a steel boat. Her name was the "Colonel".

Q. Called the "Colonel"?

A. Infinitely a more elaborate boat than this.

Q. Any others?

A. Built the "Centaur", quite an expensive ship; but she wasn't a houseboat.

Q. How large was she?

A. I don't recall, but the cost was $87,000.00.

Q. Any other yachts eighty feet or larger?

A. Yes, we built a houseboat, I don't recall her length, for a man in New York, who had the Buick agency; I don't remember his name. But the boat was eventually sold down here to a man who is on the Keys; he has a sponge grove.

Mr. Botts:

Perky?

A. Perki; I think it is Perki.

Mr. Anderson:

Perky.

(By Mr. Matteson):

Q. What is the name of that vessel?

A. I don't know the name of the vessel. He named it—I think it has had two or three names.

Q. Who owned the "Centaur"?

A. Glenn Stewart; I don't know what his initials are, but there is a man in the room who does, Mr. Munroe.

Q. Where is the "Colonel" now?

A. The last I saw of her she was bought by somebody from Jacksonville.

Q. Do you know the name?

A. No.

Q. Is she in Jacksonville now?

A. I don't know.

Q. You don't know where she is?

A. No.

Q. And the "Centaur", where is she now?

A. I don't know.

Q. And the boat you built for Mr. Perky, where is she now?

A. I don't know.

Q. Have you named for us all the boats,—all the yachts of any type, over eighty feet in length, that you have built?

A. Oh, no, sir. We build a great many boats for the Government alone, hundreds, running as much in cost as $90,000.00 apiece; many of them. We built the ferry system for the Overseas Highway, and with boats similar in many ways to the Seminole.

Q. I am talking particularly about yachts?

A. Well our experience, we have not built a great many yachts, although we have repaired hundreds of them.

Q. Now have you built any yachts since you built the Fortuna?

A. The Centaur was built since then. We built one this year, a very nice yacht; I don't know the name of that, but it belongs to Mr. Ellis of Augusta; delivered to

him last month. The last I saw of her, he named it "Maybelle", or some such name. Ninety per cent of them have got a "May" in it.

Q. The Centaur was a Diesel engine boat, was she not?

A. I think that she was; I think she had—

Q. And she was 64 feet long?

A. That is at the water line. She was a schooner.

Q. She was approximately 64 feet?

A. I don't remember.

Q. And the "Colonel", was a Diesel engined boat, was she not?

A. You might call it a Diesel engine boat; sort of a semi-Diesel engine.

Q. Now getting back to the Fortuna, what sort of gasoline tanks did you put in her?

A. As I remember it, they were square tanks. There was a boat designed as a yacht, by one of the foremost designers in the United States, Henry J.—Gielow & Orr, I think was the name at the time; but it is now Henry J. Gielow. And almost invariably a boat of her size, when you install tanks, you are limited as to the place you can put them, and they are usually square,—I mean flat surfaced tanks.

Q. It was the Fortuna, as I recall it, where you said the tanks were enclosed in joiner work so that they could not be reached?

A. I did not say that regarding the Fortuna. I said that regarding a ship I delivered last month; and that in literally hundreds of vessels that have come into our place for repairs, that in most pleasure vessels the tanks are simply stuck in some available place good for nothing else, and usually boarded up; under the floors or in the sides.

Q. Isn't it a fact that the main gasoline tanks of the Fortuna were enclosed so that they could not be reached? Or, put it this way; were in an enclosed compartment?

A. The main tanks of the Fortuna? I don't remember that, Mr. Matteson.

Q. Isn't it a fact that she had four galvanized iron cylindrical gasoline tanks?

A. I wouldn't think that that would be the case at all. I don't think that is a fact. Of course the Fortuna has been rebuilt and lengthened; and just what they did since she left our shop, I don't know. But in the original design of the ship, as I say, you may fill all your available space, especially with a thing—occupiable space with a thing like a tank; if you have any extra space to spare, then you cut the size of your ship off, as a rule, either reduce her beam or her length. A designed ship usually has flat surfaced tanks, built for the purpose for which they are intended.

Q. When was the Seminole built?

A. My guess is '22 or '23,—no, wait a minute. No, No; my guess is that she was built about '20; 1920.

Q. Well I didn't mean to try to mislead you; I thought you probably knew. It says here she was built in 1920; is that correct?

A. Mr. Matteson, we built several hundred boats, and we have figured and made intimate study of hundreds of others that we weren't fortunate enough to build. And I can tell you more about a specification of something that we bid on—

Q. Who designed her?

A. Henry J. Gielow, or Gielow & Orr, whichever was the firm's name at that time.

Q. Now you said something about her being rebuilt. I don't find any reference to that in the Register here. Are you sure about that?

A. Regardless of whether it is in the Register, she was rebuilt; whether the Register picked it up or not I don't know.

A: I don't know that; but the Captain came to Jacksonville and showed us a picture of the changed design,—the lengthening of her, and so forth.

Q. Is that recently?

A. No, a long time ago. She was supposed to be one of the finest ships of her size; photographed everywhere.

Q. Why was she altered, do you know?

Mr. Underwood:

I object to that if your Honor please; I think we have heard enough about the Fortuna. We are trying the Seminole case.

Mr. Matteson:

We are testing this witness; the views he has expressed. And the Fortuna is quite pertinent in that respect.

Mr. Underwood:

Well, he didn't reconstruct the Fortuna.

Mr. Matteson:

We don't know that she was reconstructed.

Mr. Underwood:

He says she was, and there is no proof she wasn't. This book is dated 1933, that is six years ago; and what was the reason of the owner altering the Fortuna, is no part of this case. I would like to finish this case.

The Court:

I don't see that it is material.

Mr. Matteson:

If she was such a good boat, I don't know why she should be rebuilt.

Mr. Underwood:

Perhaps the owner didn't like the color of the joiner work; perhaps he wanted a longer boat because his family had increased in size; but what of it?

(By Mr. Matteson):

Q. Isn't it a fact, Mr. Gibbs, that you originally installed in the Fortuna, four cylindrical galvanized iron tanks?

Mr. Underwood:

I object to that on the ground it is repetitious; the question has already been asked and the witness stated he doesn't remember:

The Court:

I overrule the objection.

A. I don't recall that, but we might have done that. It is entirely possible that that could have been done. Because she had an engineer with very positive views; and these rich owners very often do exactly what their captain and engineer tell them, regardless of their ability. It is entirely possible that he thought that these were the proper tanks.

Q. I suppose you still have the original plans and specifications of that vessel?

A. We might, not necessarily. We might have them. We never expected to build another one, because Gielow—we had those drawings from Gielow, and if we built another, we would pay for them; and we probably sent them to him. We sometimes keep them.

Q. Isn't it a fact that those cylindrical galvanized iron tanks were in a closed compartment?

A. I could not answer that.

Q. And isn't it a fact that that enclosed compartment was provided with four cowl ventilators, to ventilate the tank compartment?

A. I don't recall any situation of that kind.

Q. And isn't it a fact that there were six inch lead trays installed underneath the four galvanized iron tanks, in the Fortuna?

A. Not that I recall.

Q. And isn't it a fact that the reason why those galvanized iron tanks were enclosed in a compartment, with joiner work, was because you regarded them as a permanent installation, the same as you regarded the tanks on the Seminole as a permanent installation?

A. There was not one thing done on that boat because I had any wishes in the matter whatsoever. We carried out the instructions of the owner, through his naval architect, Mr. John H. Wells, and his resident inspector, captain and engineer; and the work was done from working drawings; we did exactly what we were told to do; there was no comment.

Q. Did you supply the tanks for that job?

A. As I recall—we probably did, but not necessarily. The owner, I remember, supplied his own bathtub, which was a great piece of vitreous metal; had to be ground away to fit the bow of the boat. We had nothing to do with it.

Q. And isn't it a fact that the cylindrical gasoline tanks which you installed in that vessel, were provided with access plates for cleaning?

A. I don't remember a thing about those tanks.

Q. And isn't it a fact that those cylindrical galvanized iron tanks were installed in a horizontal position?

A. I don't think that they were. I think such an installation would have impressed itself on my memory. I don't remember details for which we are not responsible.

Q. Now assuming that there were some cylindrical galvanized iron tanks installed by you in the Fortuna, would you have considered them a permanent installation, good for the life of the vessel?

Mr. Underwood:
I object to that as speculative, and immaterial.

Mr. Matteson:
Trying to estimate the life of a cylindrical iron tank, in respect to this vessel.

The Court:
Read the question.

(The last question was read by the reporter.)

The Court:
Overrule the objection.

A. It would depend entirely upon the gauge of the tank.

Q. You wouldn't have installed them in a closed compartment, surrounded by joiner work, unless you did consider them good for the life of the vessel, would you?

A. Well, I would have done whatever he had told me,—whatever our instructions were, on that job.

Q. Now Mr. Gibbs, yesterday you were citing us the Fortuna as an evidence of your experience—practical experience in the construction of vessels, on which you based the opinions that you expressed here. Do I understand that now you disclaim any responsibility for anything,—any of the arrangements of the Fortuna?

A. I claim that I had the opportunity of knowing the designing ability of the man who designed that boat. I most certainly disclaim any responsibility for the acts of an engineer or architect, just because I fulfilled his instructions to me. I believe that the knowledge that I gained by seeing the Fortuna and other boats, gave me a viewpoint and gave me experience on making a good joint and doing work properly from a standpoint

of workmanship, with no respect to design. If the Fortuna had been an abortion, I would refer to her with pride, if the work that we did on the Fortuna was done in a workmanlike manner; and would charge the designer with the abortion, if it was the design that was the abortion.

Q. As a matter of fact don't you know, Mr. Gibbs, that in 1937 it was found that the galvanized iron tanks—cylindrical tanks which you originally installed in the Fortuna, had rusted through to such extent that they had large holes in them?

A. No, I do not know that.

Q. You hadn't heard that?

A. No.

Q. And that the tanks had to be completely removed and renewed?

A. I did not know that. And enclosing them or putting them in as they were, was done under instruction, with no calculations having been made by us.

Q. The ventilation in the tank compartment, was that your idea or the designer's idea?

A. Might have been the cause of rusting the tanks.

Mr. Underwood:

If your Honor please, I object to such questions. It is quite clear that Mr. Gibbs didn't design the Fortuna; he said repeatedly he just carried out the specifications.

The Court:

That is a matter of argument. Overrule the objection.

A. I believe that it is easily possible that those ventilators might have let a good big bunch of salt water right into that enclosed place.

Q. And I take it that you would not, of your own volition, have installed ventilation for that tank compartment?

A. Only for the matter of dry rot of the compartment.

Q. Would you have installed it for that purpose?

A. It would depend. If it were metal I wouldn't do it. I wouldn't have any ventilation, with metal containers.

Q. You wouldn't have any ventilation in the compartment at all?

A. Containing tanks, unless it was a matter of dry rot.

Q. You wouldn't take into account the possibility of leakage or corrosion of the tanks at any time during the life of the vessel?

A. Not if the tanks were of sufficiently large gauge, thick enough. I would only be following the practice of stock boat builders, who, even for light gauge tanks, install permanently.

Q. Well will you communicate with your office, Mr. Gibbs, and produce for us so that we can examine them, such plans and specifications as you have of the Fortuna at the time she was constructed?

Mr. Underwood:

May I hear that question read, please?

(The question was read by the reporter.)

Mr. Underwood:

If your Honor please, I object to that. It has no probative value on any issue in this case. At most it is an attempt to get into the record by putting in plans of another vessel, the opinion of the architect who drew those plans, as to what was right at that time, for that particular boat. It has nothing to do with that, even if the plans were here in Court they would be inadmissible as proof of any fact, without the presence of the architect who drew them, so that I could have a chance to cross

examine here and find out what his views really were and why he did it. We have gone very far afield in this case. Actually, your Honor, it doesn't matter whether these tanks were well or badly designed; the question is whether they leaked. No matter how badly designed they were, if badly designed, if they didn't leak it doesn't make any difference as far as this affair is concerned. And of course, by the same token, the Fortuna's tanks are just farther removed from the issue.

Mr. Matteson:

If nothing in the boat leaked, as Mr. Underwood claims, there would have been no explosion.

Mr. Underwood:

That isn't necessarily true; somebody may have put dynamite in there.

The Court:

That is argument; you don't want this in the record, do you?

Mr. Matteson:

No, sir.

(Discussion was had off the record.)

The Court:

Gentlemen, there has been emphasized in this case, throughout, matters the importance of which I didn't appreciate at the time, and matters apparently not sufficiently connected with the relevancy, have been made so much of, the Court is impressed in connection with ruling on the relevancy of certain testimony. I don't know what magnitude is going to be given to it in the ultimate consideration of the case; and just to rule on it and ex-

clude something that might be considered by counsel to be of so momentous significance, I hesitate about excluding it. Certainly, fundamentally, we are not trying the case of the Fortuna, we are trying the case of the Seminole. What appears to me mostly is the matter of administrative policy toward this case, and getting through with it. We have here—it is Thursday, we have Friday and Saturday morning, then we have Monday; and under the arrangement now, if we don't get through with the case you have to submit it to some commissioner to take depositions.

Mr. Matteson:

I would be satisfied to have Mr. Gibbs produce that sometime next week, after we finish the Court session; let me ask the questions of him at that time. It seems to me clearly, where the witness has made statements with respect to these things. I am entitled to cross examine him with respect to them.

The Court:

Here is the possibility of relevancy; Mr. Gibbs has referred to the Fortuna as a vessel which was constructed there at his shipyard; and up until now—until the cross examination, it would appear that the experience that he had in connection with his construction was one of the matters that went into his experience, based upon which he expresses an expert opinion. Now then by cross examination it has been brought out that it was constructed, not only as appears, as I recall from direct examination, where the designer and architect was someone outside of his plant, but now on cross examination Mr. Gibbs takes the position that even though there was, according to his opinion, some wrongful theory in the architect's design, he would follow it. Now just how strong that is as affecting the Court's ultimate opinion as to his views,

is yet to be determined. Just to exclude it altogether, I think it would be error, so I am going to let it go in; but the administrative matter of getting through, is what appeals to me.

Mr. Underwood:

If your Honor please, I would like to make one further remark on the subject. There are only two possibilities: One is that Mr. Gibbs drew some of the plans; the other is that he didn't. Now if he didn't, and just built the boat according to the specifications of the naval architect who did draw the plans, it is utterly immaterial. On the other assumption, assuming that he did draw some of the plans, or was responsible for some of the design, it was 19 years ago; and even if diametrically opposed,—even if he did something then diametrically opposed to what he says today is his opinion, does not impinge on the credibility of the witness' testimony in the slightest. I did things 19 years ago that I wouldn't do today, and vice versa; and I imagine we all have. I have opinions today that I didn't hold 19 years ago, and I imagine we all have. So it does not seem to me, even if we get to these plans and take a lot of time pawing over them, it is going to advance us one iota toward the real determination of the true issues in this case.

The Court:

You will talk that over at noon; let's see if you can get together on it. I want to get through with the case, gentlemen, and if you can work that out some way and see if Mr. Gibbs can get the plans, and let's determine that, and not take up the good time of the Court now; and go forward with this.

Mr. Anderson:

Judge, let me say this, may I? He may have done it wrong 19 years ago, and profited by that experience. I

think I did that a lot of times in my professional career; I am sure we all did. Nineteen years ago a matter came up, we had to do something, and did it wrong; then we found out later we did do it wrong, and that is the basis of our ability to do it correctly today. It has not anything in the world to do with this case.

The Court:

The only possible relevancy there, I think, that entitles it to go in,—there have been mountains made out of matters I didn't appreciate at the time; there may be some relevance. I am not disposed to keep out something that may be of importance that I don't appreciate.

Mr. Matteson:

I think we can take care of the arrangement all right; we might even stop at Jacksonville on the way North.

(By the Witness):

A. As a practical matter, Judge, there is not one chance in a million that those drawings are in existence. The man for whom they were built, died shortly after. It was built under directions of the owner. There is no record in this book, of alterations, which unquestionably did exist, according to Mr. Matteson. This doesn't show it. She went to a location,—was down in the Thousand Islands. We don't make a habit of keeping the drawings that we have had and don't want, by an outside architect. We do make a very definite habit of doing what we are told to do, exactly what we are told to do; because the minute we vary from any dimension of the architect, we would then become responsible. Very often—

The Court:

Do you think you have the plans and specifications back in your plant?

A. No, sir, I don't think there is one change in a thousand that we have got plans that are 19 years ~~old~~. The Fortuna, well photographed, profusely, and a beautiful ship, with a reputation of being one of the finest ships. The Fortuna was a special ship, to suit one individual bachelor, and a ship that we would probably never build again in the world. There was no occasion to keep the drawings; and I don't think that if it had been an available stock job, that we would keep them over 19 years.

(By Mr. Matteson):

You will be willing to make a search and see what you have, would you not?

Mr. Underwood:

I object to what the witness would be willing to do; I object to this whole business.

The Court:

I think he can answer the question, Mr. Underwood.

Mr. Underwood:

Don't you think that question ought to be directed to counsel, rather than to the witness? I won't advise the witness to produce any plans unless instructed by the Court.

Mr. Matteson:

I have asked the witness to make a search and see if he can produce these plans. If he says he can't, that is one thing; but he certainly is under the obligation to make the best search he can and see if they are available.

Mr. Underwood:

I object to it, on the ground I have previously stated; and I think that Mr. Matteson, at this stage, ought to

be made to demonstrate completely the relevancy of any such fishing excursion before your Honor grants his request.

The Court:

I am not acting on the request now. I think the question is properly directed to the witness,—whether he will do that.

A. I won't answer that until I see—if this is my right, until I discuss it with counsel. Because I regard it as—

The Court

I am not ordering you to produce them; I am directing you to answer the question, to determine whether they are available.

Mr. Underwood:

I think the Court might instruct the witness, so that he may understand that he is directed to answer the question, whether he is willing to look.

The Court:

That is right,—whether you are willing to look, Mr. Gibbs; and answer the question, to see whether they are at your office, and whether they would be available in case the Court did order you to produce them. Is there somebody up there at your plant that you could direct a wire to and ask if they are there, and determine that one thing?

A. I suppose that could be done; that I could wire; but—

Mr. Underwood:

If your Honor wants that done, if you direct that that be done, I will do it, of course. I think that is something

that—I am the one who should be admonished, and not the witness.

The Court:

I may be wrong about that, but I disagree with you. I think the witness is on examination, and I think he is entitled to ask him whether they are back there at his office, whether they could be produced; and with that determined, for the Court to determine how it will be done,—if it is ordered to be done.

Mr. Underwood:

If your Honor directs that we ascertain whether they are there, we will do that.

The Court:

All right, I think that should be done.

Mr. Matteson:

That is all that I have.

(A brief informal recess was had.)

By Mr. Botts:

Q. Mr. Gibbs, can you from your experience give us any estimate as to the amount of gasoline that would be required for a single priming of motors of the type that were in the Seminole,—type and size?

A. My experience would indicate that each one of those cylinders would take about two to three tablespoons full; that that would be about what you would put in there.

Q. Two or three tablespoons full; and these were six cylinder engines, were they not?

A. Yes.

Q. That would be twelve cylinders, which would be something like thirty-six tablespoons, something like that?

A. Yes. That is just my guess. That is determined by actual operation.

Q. Well—

Mr. Underwood:

May he finish?

A. And is determined by the skill of the operator.

Q. In speaking of protecting by the use of paint, you referred to red lead as in effect, rust. Red lead is red oxide of lead, isn't it?

A. I don't know that. I was taught in school, and this of course referred to that time, that one of the best anti-corrosive paints was made of rust—of the elements that compose rust; of iron and oxygen; oxide of iron in some of its forms.

Q. Have you ever heard of iron rust being used in a paint?

A There are many paints that have the various oxides, or component parts of it.

Q. But are they used as a pigment, or as a coloring matter?

A. Well the coloring matter is a secondary situation regarding paints. You can throw anything in there; but it is anti-corrosive, it is covered up with the anti-fouling paints.

Q. Don't you know that red lead is red oxide of lead?

A. I don't know, it may be. I have attended one or two lectures where red lead was said to be a thing which is not even red lead, but as I have said in my testimony, a thing that had been described to me as red lead was essentially not an iron oxide paint.

Q. Did I understand you to say the other day that you would not get a spark in closing a knife switch?

A. I don't believe that you could, with this voltage, in the closing of it.

Q. Was it 110 volts?
A. What is that?—Yes.
Q. It was 110 volts?
A. Yes.
Q. Well you don't know much about knife switches, then, do you?
A. I know something about them; I have tested them.
Q. And you have never seen a knife switch that would emit a spark when it was closed?
A. Never.
Q. Would you be—well I don't know whether it is there now; if it is still there I would show you one at noon and demonstrate it.

Mr. Underwood:
I object to that going in the record, unless Mr. Botts is going to testify.

Mr. Botts:
All right, I will testify.

Mr. Underwood:
I don't think you could qualify, Mr. Botts, as sufficient of an expert.

Mr. Botts:
Yes, sir, I can do that too; and I will before it is through; and I can point you to the switch.

The Court:
We will strike anything from he record,—so far as any probative force, the remark should not be considered.

(By Mr. Botts):
Q. Now then you said the other day, as near as I can recall it, that you saw no evidence of a violent explosion having occurred on the Seminole?

A. Yes, sir.

Q. Did you see evidence of any explosion?

A. No, unless you call a fire,—which I can't say was due to any explosion.

Q. Do you mean to say that there was no explosion on the Seminole?

A. I don't know; I wasn't there.

Q. Well in your opinion as an expert, if there was an explosion, would there be any evidence of it?

A. There might, yes. I think it would depend upon the intensity of the explosion, as to the evidence.

Q. Well then I don't understand you to say that in your opinion there was not an explosion on the Seminole?

A. I merely state I saw no evidence of an explosion on the Seminole.

Q. Would you read the question again. —Either I didn't ask it as I intended, or you didn't answer it?

A. Conclusive proof of an explosion.

Q. Just read the last question, please.

(The last question and answer were read.)

Q. Well in your opinion, from the examination of the Seminole, was there any explosion upon that vessel?

A. It would be an absolute guess on my part. I saw nothing—no evidence to indicate an explosion.

Q. Now you say that these large tanks had been tilted out of plumb; how would you explain that?

A. Well I saw that many things had been jerked apart; not by explosion, but by the operation of the wrecker. A fire as great as that, beams perhaps falling all around, from the shed, and the removal, possibly theft, by the junk thieves; and many reasons—particularly the operation of the wrecker. When you wreck a thing of that kind, you usually hook on to it with some form of crane and jerk the whole thing up as a mass; and there is evidence that that was done.

Q. I am referring now particularly to the distorted situation of the large and heavy tanks, where they were

tilted out of plumb, and evidently not in the original position?

Mr. Underwood:

If your Honor please, I object to the question on the ground that that is not the evidence. The evidence shows that only one tank was shifted out of position,—not all of them.

The Court:

Well I think the best way to handle that,—Mr. Gibbs is a very intellectual witness; and if there is any part of his cross examination that does not incorporate some factual situation, Mr. Gibbs, you call it to our attention. I overrule the objection,—the technical objection.

Q. You say that the presence of a tank, or other tanks bent over—one or more of those tanks was out of plumb and appeared not to be in a situation as originally installed; at least one or more of them?

A. Yes, I think that is true.

Q. All right. Now then those tanks, under the evidence, appeared to have been mounted on steel supports, fastened to the bulkheads, with metal, probably, I believe steel pans underneath them?

A. Yes.

Q. Your observation confirms that method, does it?

A. As I recall it, that is essentially what was done.

Q. Now then can you explain how that tank or tanks, if more than one was displaced, could have been displaced and put in its present position without an explosion of some sort?

A. Oh, yes. In the first place, I don't see just how an explosion inside the engine room would have pressed those tanks towards the explosion. They were tilted, as I understand it, towards the engine room, were they not?

Q. I don't recall that; I think the photographs would show. I don't recall that.

A. As I remember, they were tilted inside, and not out. That would lead me to believe that unless the explosion was from in a ship, where it isn't supposed to be,—the possibilities of an explosion,—that the explosion theory wouldn't carry there. Another reason that could exist for the tilting of the tank, is the usual field, is the fact that that theory would have no such a structure as that. It is almost impossible to lay a vessel up anywhere, without a watchman there all the time, that the stuff isn't stolen, or examined with a view to stealing it, or making an offer to the owner for its purchase. And it appears to me that somebody—that if the wrecking operations didn't get that tank hooked up by error, or some other way, when they pulled it up, that possibly some junk dealer did it, to try to make an offer and buy the tanks, as good tanks. He wouldn't be much interested in them unless they were intact. But around any calamity like that you have armies of junk dealers.

Q. And you are propounding now a theory that that tank might have been displaced by mechanical means applied to it by some human force subsequent to the fire?

A. Yes; either by the wreckers, accidentally or intentionally getting it the easiest way to clear the wreck; or it might have been done by some person viciously or innocently, with a view to determining the value of the property, with a view to stealing it or purchasing it.

Q. Now you heard the testimony, I believe, of the very first, or one of the early witnesses, that there was in fact an explosion on that vessel, didn't you?

A. I didn't listen to all the testimony, and I don't recall that particular thing. I might possibly have heard it.

Q. Mr. Gibbs, assuming that there was an explosion upon the vessel Seminole immediately before the fire

started, would the fact of such an explosion be a reasonable explanation of the present distorted or unnatural condition of one or more of those tanks?

A. The assumption, coupled with my observations, would lead me to believe that that tank was not displaced due to any explosion. Even if there was one,—any possible explosions in that boat; basing that opinion on the idea that the explosion took place, if at all, in the engine room.

Q. And you just think there wasn't any explosion?

A. I didn't say that; I said I didn't think that the tank, the position of the tank, could possibly be evidence of an explosion in the engine room.

Q. Well was there evidence, from your observation, of a fire sufficient to have been the cause of that tank being put out of position?

A. No, sir. I think the fire might have melted the tank to a liquid form and not exerted any force in the world that would have tilted it as it was. I can only conceive of manual effort on the tank to displace it in the manner it is displaced.

Q. Suppose we would assume that that tank was in its present position the morning after the fire; what explanation could you give of that, if it were a fact?

A. That someone had gone there in the night and put it in that position.

Q. But I will say, the morning of the fire, and before the fire was extinguished on there, suppose it was in that position; what would you say?

Mr. Underwood:

I object to that on the ground it is speculative; on the ground there is no evidence in the record to support it. I refer particularly to Respondents' Exhibits 3-X, 3-W, which show the four gasoline tanks of the Seminole on the afternoon of the day of the fire, while the fire depart-

ment's streams are still on them, and show no displacement whatever of No. 1 tank.

Mr. Botts:

If you can't see it, you have very poor eyes, that is all I have to say. I can see the distortion of these tanks now.

Mr. Underwood:

That raises another issue in the case. I don't wear glasses, and Mr. Botts does.

Mr. Botts:

And I can see the distortion right now.

The Court:

Let's read the question.

(The last question was read by the reporter.)

The Witness:

Is that a question?

The Court:

Just a minute, the Court has a burden here. I am not ruling whether there is or is not a distortion. Technically ruling, I overrule the objection.

A. Will you read the question to me?

(The last question was re-read by the reporter.)

A. Just the last part of it.

The Court:

Do you understand what he means?

Q. The distorted position.

A. I would say that regards,—meaning people's removing rubbish, or the wreck, possibly to hunt for the body, or for any other purpose, had caused the situation; or that possibly the water had floated,—that this tank floated; would be the best possible answer. If the boat was sunk, and if the tank had no gasoline, it is possible that one side of the tank was restricted and the other side was not restricted and it floated into such a position. I think that an examination at the time would have disclosed the real cause of twisting the tank. I cannot conceive of an explosion being the cause,—any force it would exert, putting the tank in that position.

Q. Well if there was not an explosion upon that boat, from your experience as an expert, have you formed any theory as to what caused the fire, if there wasn't an explosion?

A. I have very definite theories. I would like advice of—

Q. Your are here as an expert?

A. —of counsel, as to whether I am permitted to give them.

Q. I am asking you to propound some theory other than that of an explosion, which will explain this fire?

A. The theory is, espionage. The more I think of it, the more that theory persists in my mind.

Q. By the deceased Mr. Abel, I suppose?

A. No, sir; by someone who might profit by such a disaster.

Q. And who could be in that category?

A. I would prefer not to make any speculation, but I have in my mind many people who would be tremendously interested in destroying that ship.

Q. And destroying this boat yard and all these other yachts?

A. Absolutely; not—

Q. Well, that's a new one.

A. I have another theory; Mr. Botts, you have asked for various theories; I have a theory that possibly carelessness on the part of other people might have had something to do,—even without authority.

Q. But I am trying to get the origin of a fire without any explosion on that vessel; the fire originating so rapidly that it would blow a man's leg off and cause his death, in that engine room?

Mr. Underwood:

I object to that question; on the ground that there is no proof that anything blew anybody's leg off.

Mr. Botts:

Well, the man came out without a leg; that is proof.

Mr. Underwood:

And the proof also is that he was found at a spot where the concrete would have been above him; and great slabs of concrete on his body; it is possible that the concrete severed his leg. There is no proof that his leg was blown off at all.

The Court:

I think we are getting into the realm of speculation there. That objection is well taken.

Q. I believe that is a good way to leave your explanation of this fire, anyway. You made the statement yesterday that gasoline was from one to ten per cent heavier than water?

A. That is just a guess. It is probably—of course the gasoline is much lighter than water; it was an error that I made. The gasoline is about, around four per cent lighter than water is.

Q. You have looked that up since yesterday, haven't you?

A. No, I didn't. I have repeatedly made other testimony showing that the water went to the bottom and that the gasoline rose to the top. All my testimony is filled with the position of the water in that tank, as to being heaviest and at the bottom portions.

Q. But you did make the statement yesterday that gasoline was from one to ten per cent heavier than water, didn't you?

A. Well I probably made a great many errors.

Q. I think so.

A. In the way of calling of words quickly. But I certainly do know, and did know, that gasoline was lighter than water.

Q. Do you recall any other instances in which your testimony may have been equally careless or ill-considered?

A. I don't regard that as careless. The misstatement of a word, because I could certainly catch that, and almost any person in the world knows that gasoline is lighter than water, and that oil floats on the top of water; and it is not conceivable to me that I would be held responsible for making the—calling the heavy the light; an error there.

Q. Now then I understand the engine room floor of this vessel was at a level lower than the floor of the surrounding staterooms, fore and aft, and the passageway that was on one side of the engine room; is that correct?

A. I think it was, yes.

Q. Now does the term, the bilges of the vessel, does that refer—and I am asking the question so I won't use the term improperly,—does that refer to the entire space underneath the floor of the vessel, and between that and the hull structure of the vessel? Is that what is known as the bilges?

A. Well I have known it to refer to two different things, depending upon what you are talking about. A vessel has square bilges, or abrupt bilges, that refers to the change from the approximate side of the vessel, to the bottom of the vessel. But when you refer to the bilge of a boat, with reference to where you store things, that usually refers to the entire bottom of the boat underneath the floor boards.

Q. Well then that would be an understandable use of the term, to refer to that entire space underneath the floor of the vessel, as her bilge or bilges; am I right?

A. I would think that is what you are talking about.

Q. It is in that connection that I am going to use the term, and I wanted to be sure that we understood each other on that.

A. Well I would understand that; unless you were on the outside of the ship, talking about her lines.

Q. Now then, Mr. Gibbs, the bilges of this vessel would have been a little bit lower right underneath the engine—

A. Excuse me; when you say, bilges, you get back to the corner; two things; the bilge, you mean the bottom?

Q. All right, the bilge then. In this boat, the bilge of the boat was defined on its upper level,—on its bottom level by the hull of the vessel, and on its upper level by the floor of the vessel, which was lower underneath the engine than in any other places; is that correct?

A. I would say one boundary was the bottom of the hull; the other boundary would be, in this boat, the first plane that it struck, which in this instance would be the floor of the engine room, or the floor of the boat.

Q. The floor of the boat; but the floor of the engine room was somewhat lower in that small space, than the floor of the boat, as I understand it?

A. Yes; they called that the bilge of the boat.

Q. Do you recall how much lower the floor of the engine room was than the floor of the other part of the same deck?

A. It is considerably lower, I think; the whole engine room floor.

Q. Two or three feet lower, wasn't it? A couple of feet?

A. As I remember it, about 20 inches lower than the forward end of the ship; and would probably vary due to staterooms or some—the drawings of the ship I have never seen, but the stateroom might be low or high.

Q. Then the bilge of this boat was a relatively confined surface, confined,—I mean confined area, confined by the hull of the boat, and this floor; that is true, isn't it?

A. That is true of most boats; but not nearly as confined as apparent, because usually there is a pretty large hole right under your engine,—clutch and so forth; because you don't put your engine bed on top of your floor.

Q. But I am speaking of this particular boat, that the bilge was a substantial enclosure, wasn't it?

A. Not nearly as much as would appear to laymen.

Q. Does the floor appear different to an expert than it does to a layman?

A. Yes; a layman does not conceive of things that he does not know of.

Q. A solid floor is a solid floor?

A. No, sir; a layman would think that an engine was put on the top of the floor.

Q. Well, I am not questioning about how the engine is mounted. The solid floor of that vessel above the bilges was a solid floor, whether observed by an expert or a layman, wasn't it?

A. You mean, a continuous floor?

Q. The floor that was there?

A. I won't say it was a continuous floor; I would think there were parts of it in which the continuity was broken up, that was not apparent to the eye.

Q. But it was solid, wasn't it?

A. Except for having holes, it was solid.

Q. And where were those holes?

A. They were possibly at various places.

Q. Do you know that there were holes?

A. I think so.

Q. Where were they, if you know?

A. I think they were under the engine; and around various other places that I could list in going over the drawings to refresh my mind. But there was of course—the floors had floated away, or had been dissipated in some form,—the coverings, I mean; so that we cannot know definitely where all of the holes existed. But it is safe to say that there was a very substantial hole in the vicinity of the engine room, in making the engine room common with the bilge and the boat. And that probably existed wherever it was not necessary for men to stand.

Q. Now then you are just making an assumption now without any knowledge of the fact, are you?

A. That is based on practice. I never have in my life seen someone floor up between the engine bed, of any engine.

Q. Now—

A. Neither have I seen them, in a case like that, try to avoid opportunities of ventilation by putting floor boards underneath walks, or in positions where the foot could not get, to trip, to fall.

Q. All right; now if in the bilge of this vessel, by some carelessness or otherwise, gasoline vapors should have been deposited, which I believe you stated yesterday, by reference to the authorities, were approximately three times as heavy as air,—will you explain to us how

those relatively heavy vapors would have been exhausted or removed from the bilge?

A. Yes, sir. Those heavy vapors in my opinion do not remain as independent or a distinct vapor, long. The tendency is to mix immediately with the air. The reason for such an opinion is to some extent based on the fact that the minute a bottle containing a small amount of gasoline is opened, the nose is sensible of the presence of gasoline in the bottle; meaning that the vapor, some of the gasoline itself, which formed a vapor, has mingled with the air and gotten to the nose. It was only the presence of the article itself, on the nerves of the nose, caused the sensation of smell. The theory of convection would cause the intimate contact of your vapor with your air, and then it would be swept into the air, with the general mixture, as can be proved by merely taking an open pan or cup with gasoline in, and in a very short time it isn't there any more. The theory that the gasoline goes into vapor and remains in the cup,—well, does not hold; because the only way to keep gasoline in a container is to make it absolutely air tight; because if there is an opening, it is gone. I have had considerable experience with efforts to keep gasoline, and one of them is the little skiffs that we sell; we have people complain sometimes that they did not run—the gasoline didn't last as it should have. They have it corked, and we find that a little vent hole is sufficient to let a considerable amount of gasoline out. Invariably those complaints come from people that haven't used their boat in a period we will say of a week. That happened with us. We put the gas in, immediately use it, they will get as much as ten hours use out of the given amount of gasoline. I have already testified as to the ease with which a gasoline vapor becomes a mixture, and on the fact that convection exists wherever there is any change in temperature for any cause whatever. The conclusion that I draw is that

wherever there is motion, there is tendency for a mixture of gases. I do not believe—it has been my experience that a vapor has only to come in the presence of air, to rapidly become a mixture. And if you will check up on the specific gravity of vapor, which is heavy, as compared to air, you will find that air,—that the explosive mixture, for instance, or a mixture of air and gas vapor, is extremely light, a little bit heavier only than air itself. And as soon as there is a mixture, to all practical purposes you practically have,—for specific gravities, you practically have in your bilges a gas of the same density as the air; it is actually about I think fifteen per cent,—or much less than that. You can readily see that if one is three times as dense as the other, and if it only takes about five parts of gasoline vapor to nineteen parts, or maybe twenty parts of air, to make an explosive mixture, that you are only putting a tiny bit of heavy gas and an enormous amount of light gas, and that the resultant weight of the mixture, which is explosive, becomes practically the weight of the air. Therefore there is very little difference in the air, and air-vapor, explosive mixture, as a practical matter, and with convection theories in view.

Q. Is that all?

A. Yes.

Q. Now then it is true isn't it, that there would be a less tendency to have the gasoline vapor mix with air, in an enclosed area, than there would out where air currents were freely circulating; isn't that true?

A. I would think that the circulation within the closed area would perhaps be just as rapid as the circulation in the larger enclosed area, relatively.

Q. Do you mean to say that in a tightly closed room, that the air currents circulate as freely as they do outside? You don't mean to propound that theory, do you?

A. Not with the same speed, but with the possibility—it would be hindered by the friction of the holes.

Q. All right, let me see if I understand you. Do you mean to say now to seriously contend, that if we would take this room, or any other room, and close it tightly and leave it without any moving object in here, and it remained at a uniform temperature, that there would be as substantial a circulation of the air in that tightly enclosed, quiet room, than there would if windows and doors were open?

A. You mean, if all parts were of uniform temperature?

Q. I say, that the temperature remains at the same temperature, and is tightly closed, that the circulation would be as free as it is where it is open with windows and doors?

A. Why certainly not. There would be—if you had a breeze blowing through, with another kind of temperature, in the air that came in, it would have the temperature change. Or if you had openings and with various cold or hot winds coming down, you would create those things that I said about convection.

Q. What I want to see if I can get you to express an opinion,—and I don't like to cut off these long explanations, but I would like for you to answer me, and then any explanation you want to make will be perfectly all right. Now let's take the bilges of this vessel, underneath a floor, comparable in a way to the slab of this table, and the area underneath it, with perhaps some small openings, which you have theorized; it is covered solidly; do you mean to say that gasoline vapor in that area would be dissipated as freely as it would had the floors been removed?

A. No; I think the floors would have been a deterrent on the—

Q. On the rapidity of dissipation of the vapor, wouldn't it?

A. Yes, sir.

Q. Now do you have in mind the testimony which was —and the difference from one of these handbooks, that the expansion coefficient of a gas is approximately 1/491; I

believe, of its volume, for every degree increase in temperature?

A. At 32 degrees.

Q. At 32 degrees?

A. Yes that is right.

Q. And the expansion coefficient would not be relatively changed very greatly, if it was from 80 to 81 degrees, than it would from 30 to 32, would it?

A. No.

Q. So for purposes of illustration, it would be—could be treated as approximately the same, couldn't it?

A. Oh yes.

Q. All right. Then if there was gasoline vapor, and we will take the lowest figure, three times heavier than air,—down in the bilges of that vessel; how great an increase in the temperature would have been required to bring that gasoline up—that gasoline vapor up to a temperature under which your convection,—the law of convection, would have operated to raise it up into the upper—to the overlying layer of air?

A. Oh a very very slight amount of heat would cause motion,—considerable motion; and wherever that motion existed it would occur at an opening. Wherever that opening existed, it would contact the air, and meet counter currents; and you would put that into an air mixture, which would immediately become extremely light, as compared to the air, of almost the same specific gravity; and you would get—it would be swept up with convection into the general atmosphere, from the bilge to the engine room, and from the engine room to the atmosphere.

Mr. Botts:

Well I will have to go into that a long time.

(Thereupon the hearing was recessed until 2:00 o'clock P. M. of the same day.)

Thursday, November 16, 1939, 2:10 o'clock P. M.

(Hearing was reconvened pursuant to the noon recess, and thereupon the witness, GEORGE W. GIBBS, resumed the stand and further testified as follows upon continued cross examination.)

By Mr. Botts:

Q. Mr. Gibbs, I call your attention to a folder headed, "Fire and Explosion Risks", and I will ask you if you are familiar with that work?

A. I don't think I ever saw that. I have read a book a good deal—

Q. Do you think that that is a recognized authority?

A. I would have to look; I have read a book that looked somewhat similar to that, once.

Mr. Underwood:

The book referred to is by Dr. Von Schwartz, translated from the revised German edition by Chas. T. C. Salter, reprinted for the 3rd edition, London, 1926.

A. I do not believe that if a book such as that were available to me that I would read it. It appears to be connected with buildings, rather than marine hulls.

Q. Now we were discussing a situation where there is a closed room, entirely air tight, in which there is air, and a quantity of gasoline fumes. Now I want to ask you whether or not in that situation, in your judgment, there would occur immediately or eventually, a complete equalized mixture of gas and air, so that the mixture at the top of the room would be equally impregnated with the gasoline fumes, as would the bottom of the room?

A. In my judgment it would.

Q. It would?

A. The mixture would become homogeneous.

Q. Now do you have any authority whatsoever for that statement, other than you own unsupported opinion?

A. I cannot recall any written statement that I have read, reiterating such a conclusion, that I have read. I question whether that exact problem has ever been presented to any man.

Q. Now it is a fact, isn't it, that in order for a heavier object to be lifted in a lighter,—as for instance, if there was water, and a heavier object was—an object heavier than water, at the bottom, some force would have to be applied to lift it to the surface, wouldn't it?

A. It would depend upon the nature of that heavier object. For instance if it was a piece of lead, it probably would remain in the bottom; but if it was a liquid of lead it might—or a gaseous lead, and the water became a steam, that became converted into the gaseous form, there would be in my opinion a homogeneous mixture resulting. But the liquid is a very different proposition as far as the mixing is concerned. We speak of liquids and solids.

Q. All right, now then, let's get to the exact question that I asked you; that if we have any mobile substance such as a liquid, with an object of greater specific gravity than water, at the bottom of that liquid, some force will have to be applied of some sort in order to raise it to the surface, wouldn't it?

A. Certainly.

Q. All right. Then if we have in a room filled with a gas of some sort, whether air or otherwise, and in the bottom of that room was we will say a container of equal specific gravity with air, but within that container was a heavier gas, some force would have to be applied to that gas in that container, to lift it to the top of the room, wouldn't it?

A. You mean the heavier gas, isolated from the rest, in a sealed container?

Q. Yes?

A. Yes, sir.

Q. Now then as a general thing, it is a law of physics, is it not, that any object at rest, irrespective of its weight, if it is raised to a higher level, force of some character will have to be applied to it, won't it?

A. What is that? Any—in order to move one object a force is required—to a different place? Yes, sir; the law of inertia.

Q. Then gasoline vapor is made up of minute quantities of the carbon and hydrogen of which gasoline is composed, isn't it?

A. It is a gas,—with properties of a gas.

Q. Well it is composed of the same substances?

A. You mean to ask me if there are a great many solids finely divided?

Q. No. I said, gasoline vapor is composed of minutely divided quantities of the substance which forms gasoline; to-wit, a combination of carbon and hydrogen; isn't that true?

A. What do you mean by, minutely divided?

Q. Well, small, minute particles?

A. You mean smaller than in the gasoline?

Q. Not necessarily; but whether in gas or liquid, it is carbon and hydrogen, isn't it?

A. It is a carbon-hydrogen compound.

Q. And then that substance, whether in the form of a vapor or of a liquid, would still be a carbon and hydrogen compound, wouldn't it?

A. Whatever its elements are in one state, they probably are the same in the other.

Q. Then let's get back to our law of inerta that we were speaking of a moment ago. If a heavier object is at rest,—if an object heavier than air is at rest in air, some force will have to be applied to it in some manner way, shape or form, to bring it to a higher level, won't it? That is your law of inertia, is it not?

A. To move anything, Mr. Botts, it requires a force; or, to stop anything it requires a force. That is the fundamental law of inertia,—the definition.

Q. Now let's get the specific question I asked you: If any object is at rest, at a given or determined level, in order to raise that object to a higher level; force in some manner, way, shape or form will have to be applied to it, will it not?

A. Energy will have to be applied to it.

Q. All right, energy or force. Now then that law of inertia applies irrespective of the question as to whether or not the object which it is desired to move, is large or small, doesn't it?

A. The law of inertia is universal.

Q. All right. Then if we have a gasoline vapor, concededly approximately three times or more heavier than air, and we have that in an enclosed room, where no external force is applied; when you say that that gasoline vapor, without any force being applied, would rise to the higher level, aren't you then disputing the very law of inertia which you have just expounded?

A. I will have to have the first part of the question over.

Mr. Botts:

Please read it.

(The question was read by the reporter.)

A. I do not say, have not said, that that would rise without any force applied, or changes that assume motion of any kind.

Q. Then how will it become mixed and reach the ceiling of that room?

A. It won't without certain forces.

Q. All right then, now we are getting somewhere.

A. The premise is,—let's understand this, that there is no force of any kind. For instance, the force—which don't apply here, of osmose, where a diaphragm inserted in a tank, with one liquid on one side and another liquid on this

side, and those two liquids transfer through the porous wall, merely because they are separated by a porous wall; a law of physics.

Q. Nothing strange about that.

A. So strange that no one knows why; never yet been able to discover a reason.

Q. Nor do you know the reason why a catalyst operates, either, do you?

A. A what?

Q. A catalyst. Don't you know what that is?

A. Oh yes; if you pronounce it right I may tell you. Catalysis, is that what you mean?

Q. You don't know why that operates, either, do you? How it operates? Then let's—I concede that you know more technical engineering terms than I do; let's confine ourselves now not to exhibitions of expert knowledge on other things, but this particular question?

A. I will try to do that Mr. Botts, and at no time will I make one statement which does not bear, in my opinion, directly on the answer to the question that you put to me.

Q. All right. Then the law of cosmos, or whatever that was, is out?

A. Not in my opinion, sir.

Q. Now then we have gotten to the point that if gasoline fumes or vapor are in an enclosed space, that they will remain inert, or in location at the bottom of the container, unless some force is applied: Is that correct?

A. That is correct.

Q. You say it is?

A. Any bit of mass will remain inert unless force is applied,—or continue in motion unless force is applied.

Q. And we can go further, I take it,—that the object to be moved can only be moved in proportion to the quantum of force applied; is that true?

A. I would like to know what quantum means.

Q. Quantum, amount, extent.

A. Will you read that to me?

(The question was read by the reporter.)

A. Oh, yes, that is true.

Q. Now then—

A. The quantity of force and the—coupled with the friction that must be overcome in the removal, and the—

Q. It still moved in proportion to the amount of force, however that force may be dissipated?

A. But there is the factor of friction which also—it would remove inversely as the friction.

Q. It still is a question of dissipating the force in moving the object, whether in a direct lift, as in a vaccum, or coupled with friction?

A. One element of it is friction.

Q. I think you have agreed, however, that friction in air is rather small, isn't it?

A. It is,—depends upon what forces you are dealing with.

Q. I believe you testified this morning that one gallon of gasoline would produce 23.6—22.6 cubic feet of gas vapor?

Mr. Underwood:

I think that was read from a book, wasn't it Mr. Botts?

Mr. Botts:

Well it is in evidence; he either testified to it or conceded it; I don't know which.

A. One gallon of gasoline would produce—

Q. 22.3 cubic feet of gasoline vapor?

A. Well if there is some authority on that I would be inclined to accept it. I don't know exactly what it is.

Q. Well that was the figure that was produced from this Kent's book this morning, and to which I understood you agreed.

A. Well if that is in Kent's, I would be inclined to accept it. You mean that the vapor, the 20 cubic feet of vapor:

Q. 22.3 cubic feet of gasoline vapor is the result of one gallon of liquid gasoline.

A. Cubic feet?

Q. Cubic feet. Now those were the figures that—

A. All right, in preference to any argument we have got, that is all right.

Q. Do you know the weight of a gallon of gasoline?

A. Not offhand; I know approximately what it is; for all my purposes a pint of gasoline weighs somewhere near one pound.

Q. That would be then—

A. It is about seven and a half pounds, is what it weighs—what a gallon weighs.

Q. Would you be willing to refer to Kent and give us the exact figure; and accept that?

A. It won't vary anything hardly from that. I have used it a thousand times. I can look that up.

(Discussion was had off the record.)

Q. For purposes of my examination I am willing to accept that, because the purpose of it makes no difference, but I didn't want to get anything that was inaccurate in there later. Then if you had 22.3 cubic feet of gasoline vapor in a room, it would take seven and one-half foot pounds of energy to raise that one foot, would it not?

A. It would take some pounds.

Q. Well eliminating our element of friction—

A. To raise it? Unless you had a corresponding column coming down, for instance if this room was filled with that vapor, uniform texture, which it would be, it would take almost no energy to lift that amount to the ceiling.

Q. Granted, but the room that I am calling your attention to isn't filled that way. I am trying to get you to show me how you can supply the energy to fill it.

A. What is that?

Q. Now I am speaking, not if you have a force from above, coming down, and pushing it up; that is energy, irrespective of how it originates, isn't it?

A. If you push,—if you take the whole room, all of it, so there is no counterbalancing column, it would take a certain number of foot pounds to raise it.

Q. All right.

A. Lift the whole thing up, not this up and that down.

Q. It will take seven and a half foot pounds of energy to move a gallon of gasoline—to raise it one foot in height, irrespective of whether that is in the form of gasoline vapor or gasoline in liquid; isn't that true?

A. To raise any weight—

Q. Let's confine it to the question, gasoline, if you don't mind.

A. Gasoline would take a number of foot pounds to raise it, which would be a function of its weight, as though it were steel or shot or anything else.

Q. Exactly; in other words it takes—assuming that weight of seven and a half pounds per gallon, it would take seven and a half foot pounds to raise that gallon of gasoline one foot, wouldn't it?

A. I think so.

Q. And that would be true whether the gasoline was in the form of liquid or in the form of gasoline vapor wouldn't it?

A. Provided it was in a restricted column and there was not a counterbalancing column to take its place.

Q. Well if you have a counterbalance, you are supplying further energy?

A. No, there is no energy, one way or the other, except a slight energy of starting a frictionless body.

Q. Well I would like to argue that question with you, because I know you are wrong; but I won't. Do you mean to tell me that when an elevator counterweight comes down, it isn't supplying energy on its way down?

A. Contrary; I said that it did supply the energy which offsets the desired energy to lift the elevator, just as you have in convection.

Q. Then I misunderstood you; all right. Then if you don't mind now, let's not supply any other factors than those that I put in my question. Then, after you answer the question, you can supply all the other factors that you want to, and give any discussion of those that you want to. Now I am suggesting to you this; that here is a gallon of gasoline, and it is desired to raise it one foot in height. It will take seven and a half foot pounds of energy from some source in order to accomplish that result, will it not?

A. Yes.

Q. And that would be equally true whether that gasoline was in the form of a liquid or in the form of gasoline vapor of equal weight, would it not?

A. Yes.

Q. I also understood you to say just a few minutes ago, and I want to be clear on that; that if we have a perfectly tight receptacle, in which is air and gasoline vapor, —we will say 22.3 cubic feet of gasoline vapor, and the area of that receptacle is,—the square area is 22.3 square feet and it is ten feet tall, and in it is air and 22.3 cubic feet of gasoline vapor, and there is no external force by way of heat or otherwise applied to it, so that it remains in its present temperature; I understood you to say awhile ago that under those circumstances there would be no motion of the gasoline vapor, and that it would remain at the bottom of the chamber, and the air would remain at the top; is that right?

A. No such problem was put to me, as that.

Q. Well then I tried to ask you that question awhile ago, and I thought you answered it. Now then take that

problem and give me your answer. Will the gasoline vapor remain at the bottom or will it ascend to the top?

A. Under the hypothesis—

Q. That is what I want you to confine yourself to.

A. That no forces of any kind—heat,—the principles,—or any other principles of physics which would cause forces to be set up are applied, it would remain there in that condition which could not exist as a practical matter.

Q. All right then, under that hypothetical question the gas would remain at the bottom and the air at the top: all right now, then in order to produce an equal mixture—

Mr. Botts:

There is Mr. Hawkins, and I would rather suspend before I ask this next question, because I have a number of them.

(The witness George W. Gibbs was temporarily withdrawn from the witness stand.)

3852 Thereupon: J. E. LAWTON as a witness on behalf of Libelants', in rebuttal, was sworn and testified as follows:

The Court:

What is your name?

A. J. E. Lawton.

The Court:

Where do you live?

A. 1868 S. W. 17th Terrace, Miami.

Direct Examination.

By Mr. Matteson:

Q. Mr. Lawton by whom are you employed?

A. By the Retail Credit Company.

Q. And how long have you been employed by that company?

A. Since November 1st, 1931.

Q. In what capacity are you employed by that company?

A. As an inspector.

Q. What is the nature of the business of that company?

A. The Retail Credit Company is a national reporting organization; it was established in 1899, with home office in Atlanta, Georgia. We make reports to the home office of various insurance companies, and also for credit purposes.

Q. And upon request, do you make investigations?

A. On direct request from the customer.

The Court:

I expect you had better let the record show that this is a witness for Libelants?

Mr. Matteson:

Yes, sir; just ahead of the testimony, you can say, a witness for the Libelants, in rebuttal, taken out of order.

(By Mr. Matteson):

Q. In April 1935 did you have occasion to make an investigation with respect to the Seminole Boat Company?

A. Yes, sir.

Q. Will you tell me what you did?

A. We received an inquiry, I believe it was from Chubb & Son, an insurance company in Atlanta; the inquiry was on the Seminole Boat Company, as I recall, and H. C. Phipps. I was in Palm Beach as an inspector for the Retail Credit Company for three years, and I had some occasion to know something of the Phipps brothers; so I called on Mr. Roy H. Hawkins, of the Biscayne Boulevard Company, who was their local representative, and the only man I know connected with the organization. I asked

him to please furnish me with the names of the officers of the corporation. Mr. Hawkins gave me the change of name; I believe the change was from H. C. Phipps to John S. Phipps, as the new principal in the business,—at least, an executive in the business. My report was written on the Seminole Boat Company and/or John S. Phipps. It was for insurance purposes, as I recall.

Q. Did you ask Mr. Hawkins for information with respect to the company?

A. Yes, sir.

Q. Did you make a report with respect to your investigation?

A. Yes, sir.

Q. I show you Libelants' Exhibit 106 for identification and ask you what that is.

A. This is a report rendered by myself as an inspector for the Retail Credit Company, to Chubb & Son in Atlanta, Georgia; our account 8957.

Q. Was that document actually written by you?

A. Yes, sir.

Q. Was the information which you received from Mr. Hawkins, incorporated in that report?

A. Yes, sir.

Q. Put it the other way around; where did the information that is contained in that report,—where did you get that from?

A. The only person that would have any local knowledge of the change of the corporation, and its affairs—

Mr. Underwood:

I object to that as not responsive.

Q. Put it this way: What was the source of the information which you received?

A. The source of information was, Mr. Roy H. Hawkins, Secretary of the Seminole Boat Company.

Q. I think you said you interviewed Mr. Hawkins?

A. That is correct.

Q. And what was the date of that interview?

A. I can't say positively but my report was made the same date that I interviewed him; the report was made 4-18-35. Our basis for collecting reports is within four days after they are received. The man was interviewed within four days of 4-18-35.

Q. That would be April 18, 1935?

A. That is right.

Q. Now on the occasion of your interview with Mr. Hawkins, will you please tell me if he made the following statement to you, in words or in substance: "The Seminole Boat Company is a closed corporation, and is not a trading company, and is not engaged in business".

Mr. Underwood:
I object to that.

Mr. Matteson:
I have read the question exactly as I put it to Mr. Hawkins when he was on examination; I asked him at that time whether he had made that statement, and he replied that "I did not say that".

The Court:
The time and place was incorporated in the question to Mr. Hawkins?

Mr. Matteson:
Yes, sir.

The Court:
What is the objection?

Mr. Underwood:
I will withdraw it.

A. That is the information incorporated in my report, and to the best of my knowledge and belief, he did.

Q. And did he also at the same time and place make the following statement to you, in words or substance: "This is a holding company for the Yacht Seminole, which has been in the Phipps family for the past five or more years, and is now principally owned by John S. Phipps, the older brother of H. C. Phipps, the latter being no longer interested in the company or in the boat".

A. Yes, sir.

Mr. Matteson:

That is all.

Cross Examination.

By Mr. Underwood:

Q. How long have you known Mr. Hawkins?

A. I don't believe I met him on more than that one occasion.

Q. Where did this interview take place?

A. In the office of Biscayne Boulevard Company, Fourteenth Street and Biscayne Boulevard.

Q. Where, in the building?

A. As I recall it, Mr. Hawkins' office was the second office on the left as you entered the building. I was kept waiting in the vestibule from the main office; he apparently had someone in his office, because he came out and interviewed me in the reception room or the hall, rather than in his office individually.

Q. Did this entire interview then take place while you were both standing?

A. Yes.

Q. You didn't go into Mr. Hawkins' office?

A. I did not go into his office; I was not seated.

Q. Did you go up or down any stairs?

A. No stairs.

Q. The interview took place on the ground floor of the building?

A. On the ground floor, so far as I know?

Q. Whom did you ask for when you went in?

A. Mr. Hawkins.

Q. Whom did you speak to at first? Whom did you ask for Mr. Hawkins?

A. I did not know the man; I don't know who he was.

Q. What did he look like?

A. I couldn't describe him.

Q. How long did you talk to him?

A. Just asked him for Mr. Hawkins.

Q. Was it a man or a lady?

A. It was a man.

Q. You say that Mr. Hawkins came from a room at your left as you entered the front door?

A. That's correct.

Q. The second room from the front of the building?

A. As I recall it.

Q. When did you first receive any inquiry about this report that you made, after you made it?

A. After I made it? The first knowledge I had that the report would ever be used—

Q. No; just when did you first receive any inquiry about it?

A. I wouldn't be able to state anything definitely; it was within a year after the report was made, to the best of my recollection.

Q. Did Mr. Hawkins tell you that he was 45 years old?

A. No, sir. My estimate of ages are estimates only.

Q. You made in your report the statement that Mr. Hawkins' age was 45; is that correct?

A. That's correct.

Q. That is your estimate?

A. That's my estimate.

Q. Was it your estimate too, when you reported that the Seminole Boat Company is a successful firm?

A. Can I see it a moment?

Q. Certainly.

A. That is based on information I gathered in my investigation.

Q. Did you investigate any place else?

A. Oh, yes.

Q. Oh, this is not entirely based ûpon Mr. Hawkins?

A. The information—

Q. Is it or isn't it?

A. The information indicated as to the ownership of the business, is based on Mr. Hawkins' statement.

Q. Is this report or is it not entirely based—

A. The report—

Q. Wait until I finish my question. Is it or is it not based entirely upon information that you say you got from Mr. Hawkins?

A. The report is a compilation of facts.

Q. Will you answer my question yes or no, please? Is it or is it not based entirely upon information which you say you got from Mr. Hawkins?

A. The report as a whole, no.

Q. Is it or is it not?

A. No.

Q. It is not. Now did Mr. Hawkins tell you that the firm is successful?

A. I couldn't recall such a statement as that.

Q. Did Mr. Hawkins tell you the future outlook was good?

A. I can't recall it.

Q. Did somebody give you that information?

A. Someone apparently did.

Q. Well do you have any doubt about it?

A. None whatever.

Q. Well as a result of your investigation, you considered that the Seminole Boat Company was a successful business and that it's outlook was good; is that correct?

A. That's correct.

Q. Where else did you investigate the Seminole Boat Company?

A. Our sources of information are confidential, and if you wouldn't care to insist, I wouldn't care to state.

Mr. Underwood:

If your Honor please, I move that the witness' entire testimony be stricken from the record.

Mr. Matteson:

If your Honor please, the testimony of the witness on the pertinent points is certainly directly obtained from Mr. Hawkins. I think we all appreciate that there is a reasonable reticence as to other sources of information; I think they ought to be respected. I certainly think there is no basis for striking any testimony.

Mr. Underwood:

I don't think my right to cross examine this witness is to be circumscribed one iota by his reluctance to go into the sources of his information.

Mr. Matteson:

As a matter of fact, the witness hasn't refused.

Mr. Underwood:

I understood his answer as a refusal.

Mr. Botts:

The witness as I understand stated that unless counsel insisted, he would prefer not to state.

A. That's my statement.

Mr. Botts:

Well is there anything wrong with that?

Mr. Underwood:

No, I just misunderstood the witness, Mr. Botts, or else he changed his view,—one or the other. Withdraw my motion for the present.

(By Mr. Underwood):

Q. What other sources of information did you have?

A. As to the standing, reputation, and character of Mr. Phipps, the First National Bank testified.

Q. How about the Seminole Boat Company? You weren't asked to investigate Mr. Phipps, were you?

A. I was asked to investigate the Seminole Boat Company, and—

Q. And then—

Mr. Botts:

Wait until he finishes his answer.

A. I was asked to investigate the Seminole Boat Company and H. C. Phipps.

Q. Let's leave Mr. Phipps out of it for the moment. What other sources of information did you have with reference to the Seminole Boat Company, besides Mr. Hawkins?

A. The First National Bank of Miami testified as to the character of the organization—of Mr. Phipps.

Q. Of the Seminole Boat Company?

A. Of Mr. Phipps.

Q. Did you hear me ask you to lay Mr. Phipps aside for the moment, and tell me what other sources of information you had about the Seminole Boat Company?

A. I had no other source of information about the Seminole Boat Company.

Q. Then it must be that it was Mr. Hawkins who told you that the firm was successful, and that the future outlook was good; is that right?

A. I have no way of stating whether that is correct or not.

Q. Let me try it again. Did you have any source of information about the Seminole Boat Company when you made this report, other than Mr. Hawkins?

A. None other than Mr. Hawkins; that's correct.

Q. You did in your report make a statement that the Seminole Boat Company was successful and that it's future outlook was good, did you not?

A. Yes.

Q. And is it not therefore the fact that you got that information from Mr. Hawkins?

A. It must be; I didn't manufacture it.

Q. What did Mr. Hawkins look like?

A. As I recall him, he was a large man with dark hair.

Q. Is that as good a description as you can give of him?

A. I saw the man only once, to my knowledge. I wouldn't be able to pick him out and describe him more accurately.

Q. Did anybody introduce you to him?

A. Yes, sir.

Q. What did that man say?

A. I couldn't recall a thing like that.

Q. Did Mr. Hawkins tell you that the Seminole was used in Florida waters in the winter, and around New York in the summer?

A. I believe that he did.

Q. Did he tell you that she is a large, well-equipped yacht?

A. Yes, sir.

Q. Did he tell you that she was capable of ocean travel?

A. Yes, sir.

Q. Did he tell you that she was occasionally used for that purpose—ocean travel?

A. I couldn't recall that.

Q. Will you look at your report, down toward the bottom, and see if that refreshes your recollection? Does that refresh your recollection any?

A. That does not refresh my recollection; no, sir—identify the statement.

Q. Did Mr. Hawkins tell you that H. C. Phipps was proprietor of the Seminole Boat Company?

A. No, sir.

Q. Where did you get the information up here at the top?

A. The information was a description from the inquiry received by my office from Chubb & Son in Atlanta. Our inquiries come in on, we will say a small ticket.

Q. Perhaps I can shorten it a little bit. If you want to go on after you answer this question, and explain, you may. Did the inquiry that came to you from Chubb & Son, describe the Seminole Boat Company,—describe H. C. Phipps, rather, as the proprietor of the Seminole Boat Company?

A. Exactly yes, sir.

Q. Where is the inquiry that came from Chubb?

A. Chubb & Sons have the inquiry.

Q. Did you send it back to them?

A. We send our inquiry to our home office in Atlanta; they send it, at the end of the month, to Chubb & Son.

Q. Have you a copy of it?

A. No, sir.

Q. Will you write to them and get a copy of it for me?

A. I have no authority to do that. I will do anything the Court orders.

Mr. Underwood:

If your Honor please, I don't want to have to incur the expense of going to Atlanta and subpoenaing this document, but I would like very much to see it.

Mr. Matteson:

If your Honor please, I can't see what possible relevancy there is to it. The witness says it described the Seminole Boat Company, H. C. Phipps, Proprietor, on it.

Mr. Underwood:

It has as much relevancy as the balance of the 19-year old boat—what was the name of it?

Mr. Anderson:

Fortuna.

Mr. Botts:

It is purely in impeachment of a prior witness; and that does not go to the impeachment.

The Court:

Well if we had a case with a jury, and were ready to go to trial, I don't think I would hold up the case to get this. Neither would I in regard to the Fortuna. But I have come to the conclusion, about the Fortuna, if Mr. Gibbs had the plans and specifications with him, or if he could have gotten them from his place of business, locally, or over the noon recess, why I would allow him to be examined in regard to them, and allow counsel to look at them; but to require them to be filed in evidence, I should not do that. I think I will follow the same rule here; if the witness can get this information, I think it has a possibility of relevancy and will allow it to be brought in if he can get it. So I will allow counsel to propound the question to the witness, whether he can get it; and if he says he can, let him respond as to whether he will get it or not.

(By Mr. Underwood):

Q. Will you write to them and ask them for it?

A. I will write to them and ask them for it.

Mr. Underwood:

Thank you very much. That is all.

Re-Direct Examination.

By Mr. Matteson:

Q. Just a minute; I think that you said that your ultimate investigation was with respect to John S. Phipps; why was that?

A. In making my investigation I learned that Mr. H. C. Phipps was no longer proprietor of the Yacht Seminole; that it had been incorporated as the Seminole Boat Company, with Mr. John S. Phipps as President, as the principal, and Mr. Roy H. Hawkins as Secretary.

Q. From whom did you obtain that information?

A. Mr. Roy H. Hawkins.

Mr. Matteson:

If your Honor please, there certainly is nothing to be concealed about this; we will be very glad to cooperate, to get any information relative to it at all. It seems to me the facts are perfectly clear, and clear on the face of the report. An inquiry came in describing the Seminole Boat Company as H. C. Phipps, Proprietor. The question is, what were the results of his investigation and talk with Mr. Hawkins; and I don't see that anything is going to be added at all, by adding anything further. I am willing to concede any facts that can reasonably be said to be true; and I am willing to have this filed in evidence; willing to take any steps Mr. Underwood wants, to obtain the original inquiry, or anything connected with it, to satisfy his curiosity to the fullest extent. It just seems to me it is unnecessary. Would any object be served by filing this report in evidence?

Mr. Underwood:

No.

The Court:

All right, you report what you find out, to Mr. Matteson, there; or, if he is not here; you better report to Mr. Dyer; you know his initials,—Mr. Dyer?

A. Batchelor & Dyer; yes, sir.

Mr. Underwood:

Perhaps that could be done by telegram, and we can get through some day.

Mr. Matteson:

Might I suggest this; I would be glad if you will send a telegram for it, at our expense, in order to facilitate it.

A. I shall do so.

Mr. Matteson:

And do you understand definitely what it is that Mr. Underwood wants?

A. Mr. Underwood wants the inquiry ticket, I believe, that covered this—that called for this report.

Mr. Underwood:

The communication that you got from Chubb, that called for that report.

A. That is correct.

(Witness excused.)

Mr. Underwood:

I think also, by agreement, I would like to recall Mr. Hawkins at this time.

3867 Thereupon: ROY H. HAWKINS as a witness on behalf of Respondents, was recalled and further testified as follows:

Direct Examination.

By Mr. Underwood:

Q. Mr. Hawkins you have already been sworn. Did you see the witness on the stand who just testified, Mr. Lawton?

A. Yes, sir.

Q. Were you ever interviewed by him in 1935?

A. No, sir.

Q. Did you ever tell him that John S. Phipps was the Proprietor or the principal of the Seminole Boat Company?

A. No, sir.

Q. How old were you in 1935?

A. 35.

Q. Where was your office in that building?

A. On the second floor of the building; still is.

Mr. Underwood:

That is all.

Cross Examination.

By Mr. Matteson:

Q. Mr. Hawkins whose room is the second room on the left-hand side as you enter the offices of Biscayne Boulevard Company?

A. It is the bookkeeper who usually answers such inquiries as this.

Q. What is his name?

A. Wilson.

Mr. Matteson:

That is all.

(Witness excused.)

3868 Thereupon: GERGE W. GIBBS resumed the witness stand and further testified as follows upon continued:

Cross Examination.

By Mr. Botts:

Q. Now Mr. Gibbs you will recall we were discussing a chamber, the horizontal cross-section of which was 22.3 square feet, and it was ten feet tall; and in that was air to which was added 22.3 cubic feet, or the equivalent of one gallon of gasoline vapor, entirely enclosed, so that no air—outside air currents or anything like that could reach it. And under those circumstances I understand you to say that the gasoline vapor, without the application of some outside energizing influence, would remain in place at the bottom?

A. I said that without the application of any force whatsoever, outside or inside, it would remain at the bottom.

Q. All right. Now then if you applied force which would cause that entire volume of 223 cubic feet of the contents of that receptacle to become an equalized—homogeneous is the term, I believe, you used,—mixture of gasoline vapor and air, some degree of force, from some source, would be necessary, according to your previous statement. That is correct isn't it?

A. Yes.

Q. Now then it is true—

A. If that same thing became a mixture.

Q. Yes. In accomplishing that mixture then, that seven and a half pounds of gasoline vapor at the bottom, would part of it be raised to the top, and part of it be raised midway, so that there would be an approximate raising of four and a half to five,—an average of four and a half to five cubic feet raising of the weight of that mixture, in

order to have part of it raised clear to the top, or nine feet of raising, and the other part only raised a foot?

A. The foot pounds of energy required to do that would be determined by the height of the center of gravity of the—new center of gravity with respect to the old center of gravity.

Q. Well roughly that would be a raising of four and a half feet, wouldn't it?

A. Might be; I would rather imagine, somewhere about that.

Q. And four and a half times seven and a half is thirty-three and three quarters, so it would require some thirty to thirty-five foot pounds of energy to accomplish that mixture, wouldn't it?

A. It might.

Q. Now then if the energy applied to accomplish that was heat alone, then if I understand your definition of convection correctly, the operation would be that of convection would it?

A. If it was heat alone that brought it about?

Q. If that was the energy that was applied, the operation would be one of convection, would it not?

A. Practically speaking, yes.

Q. All right now then—

A. But understand this Mr. Botts; that the application of heat or cold, or the absence of heat, but relative heat is what I imagine.

Q. Well the force would have to come from somewhere, however supplied; it would have to be force.

A. That is right.

Q. Now if you raised the temperature of that body of 22.3 cubic feet of gasoline vapor, assuming it still to be at the bottom of your chamber,—if you raised it one degree it would be raised approximately 1/491, or roughly speaking, 1/500'th of its volume; it would be increased in volume approximately 1/500 wouldn't it?

A. Yes; that is for each 500 cubic feet, one degree of temperature.

Q. Yes.

A. Would raise the volume, increase the volume approximately one cubic foot.

Q. Wait a minute; one degree would raise the volume of that 1/500 of its volume, wouldn't it?

A. That is right, one gallon; did you say, 500 cubic feet?

Q. There are 22.3 cubic feet involved. Now then if we raise that 1/500 in volume.

A. There are how many?

Q. 22.3 cubic feet.

A. Well it would be 1/500 of that.

Q. Which would be some four thousandths, plus, of a cubic foot.

A. Whatever it figures out.

Q. Wouldn't it be almost impossible to heat that to a great enough temperature to raise the volume—the specific gravity of that gasoline vapor sufficiently to equally distribute that throughout the chamber? The heat necessary would be almost prohibitive, wouldn't it?

A. It would be an extremely small amount.

Q. What?

A. To raise a body of very little mass, a degree of temperature, does not take much heat.

Q. But you didn't understand my question. I am trying now to find out, one degree of heat would raise it about 4/1000 of a cubic foot in volume. Now it is—

A. What do you mean by one degree of heat?

Q. I mean, raising the average temperature of that 22.3 cubic feet of gasoline vapor would increase the volume of the entire mass of gasoline vapor about 4/1000 of a cubic foot in volume wouldn't it?

A. Well if that became—was increased in temperature one degree:

Q. Yes.

A. Then its mass would be increased 1/500; but how much energy are you talking about?

Q. Enough energy to increase it one degree.

A. Which is a very small amount.

Q. All right, I concede that. That isn't the point I am trying to get at. I am not interested in how much energy, I am interested in the results. So that instead of raising that one degree of heat, and instead of having 22.3, we would have 22.304 as the volume, wouldn't we?

A. 1/500 more with the increase.

Q. Which is roughly 4/1000?

A. Yes.

Q. Now then how many degrees of heat would it be necessary to apply in order to decrease the specific gravity of that gasoline to one-third,—of that gasoline vapor, to one-third?

A. Enough to supply that energy required to change those centers of gravity of the new liquids.

Q. You haven't gotten the question yet. How many degrees of heat would be required? How much are we going to have?

A. You have a room filled, have you not, with gas?

Q. Umh hmh.

A. And it takes energy to bring—heat, we will say:

Q. Yes, heat.

A. And heat is energy.

Q. Certainly.

A. All right, but the increase in temperature does not mean energy.

Q. It is the result of energy?

A. It is a matter of what had happened; but you want to know whether there was—whether this could have been done by any forces that could have been conceded.

Q. You haven't understood the question yet, so let me try it again. The specific gravity of this gasoline, for the purpose of this we will take the lowest figure, one-third—I mean three times that of air.

A. Yes.

Q. Now then, in order to raise that so that its specific gravity would equal that of air—

A. The mixture.

Q. Of the air—wait a minute: in order to raise the specific gravity of the gasoline mixture, the gasoline vapor, so that it was equal in specific gravity to air, we would have to raise it approximately one thousand degrees in temperature, wouldn't you?

A. It would be three times its present specific—

Q. Volume. And if one degree will raise it 1/500, five hundred degrees would raise it one; and a thousand degrees—so it would take approximately a thousand degrees of temperature; am I right?

A. That is approximately right.

Q. So that the application of heat alone, you would melt any ordinary receptacle before you could apply that much heat, wouldn't you?

A. What is that?

Q. I say, you would melt any ordinary receptacle before you could apply that much heat, wouldn't you?

A. That wouldn't follow at all.

Q. You say so, but I would like, when you make a statement, if you don't mind, to support it either with authority or reason.

A. Well the minute that you have any change in this closed hypothetical place, you begin to change a substance which is one gas, into a mixture of gases. And with the mixture of gases you get—it is a different proposition; you get your—you have very little difference between the weight of air and the weight of the mixtures; and great ease with which the laws of convection apply.

Q. But the laws of convection, or any other law, require equal amounts of force to lift an inert object, whether it is the law of convection, or an explosion of gunpowder, doesn't it?

A. But you haven't indicated that there is any energy required.

Q. I thought we agreed that heat was energy, or was a manifestation of energy.

A. You are talking about a scale,—degrees of temperature. You don't give the cause of the increase. The cause of the increase might be a match,—a match applied to that area of—I mean the heat that comes from a match might be enough energy to raise that volume from one volume to the other.

Q. Naturally a certain amount of heat will raise a certain amount of temperature; but it isn't going to supply the foot pounds of energy necessary to raise the whole mass, is it?

A. What is that?

Q. A small amount of heat is going to supply the foot pounds—

A. You are talking about foot pounds; you are getting to the element of energy; but the ouly way that you can discuss it at all, is the application of energy to the mass, to raise it up.

Q. It took me a long time to lead you to that conclusion, but I agree with you. Now then, I want you to tell me if you say that gasoline vapor in a container will be raised and become a homogeneous mixture; I would like for you to tell me how it can be done without the application of the requisite amount of energy, from whatever source it comes.

A. It would require a requisite amount of energy from the very start, to bring about that homogeneous mixture.

Q. And isn't it perfectly ridiculous to say that a change of one degree in temperature, increasing that mass 1/500 of a volume, would supply a sufficient amount of energy to accomplish that admixture?

A. No, a change of one degree, plus other forces that set in there, in the practical case like the engineroom of the Seminole, might do it.

Q. What other forces are you talking of?

A. Forces of convection; forces of balanced columns; the forces of—that stand because—

Q. Now Mr. Witness, I am not a fool, and I have studied physics. Now then the force of convection, whence is the source of this force of convection that you are talking about? Is it other than heat?

A. Yes, it is the force of convection—it is due very largely to heat.

Q. Entirely to heat, isn't it?

A. Entirely to heat.

Q. Well then, you talk about force of convection, then you are merely talking in technical language about the force or energy derived from heat, aren't you?

A. Yes.

Q. All right; well then a sufficient amount of heat to raise the temperature of that gasoline vapor one degree, thus increasing its volume by approximately 1/500, would not be sufficient energy to apply the requisite number of foot pounds to raise that several feet, would it?

A. Well, one degree rise in temperature must be considered in the terms of the energy required to create it.

Q. Well—

A. One degree of heat, a rise in temperature of one degree of heat, of water, is a very large unit; of iron, it is a different unit. Depends entirely—

Q. And of gasoline vapor, it is a different unit, isn't it?

A. Probably.

Q. That is kindergarten stuff.

A. It is kindergarten stuff, much of this is kindergarten stuff, but that doesn't mean for one minute that it is not vital stuff.

Q. All right; now then I want you to tell me, let's take the bilges of this yacht Seminole; according to your associate, approximately forty-four, I believe it was—4400 cubic feet in volume was his estimate of it, and that is filled; let's assume there is some gasoline vapor down in

there, maybe the forty-four cubic feet which he said would make it an explosive mixture; there is forty-four cubic feet of gasoline vapor down in that bilge. Now then that is approximately—represents approximately two gallons of gasoline. Now from whence are you going to get the force that will clear these gasoline fumes out of that bilge?

A. Back to the Seminole now?

Q. Umh hmh.

A. All right. There would be continuous circulation below the floorboards.

Q. Why?

A. In what is known as that bilge, due to the heat, and due to the fact that your columns are balanced, and that you do not require much energy for the circulation, because instead of these foot pounds you talk about, the force comes right back; when one goes up, the other goes down, and you have your elevator again; and you can therefore have very violent turbulance beneath the floor of your engineroom. Because then you have a balanced column, and it requires almost no energy, without raise of any temperature, hardly, to create turbulance, at least below the floor of that engineroom. Another thing, the gas that is down below that engineroom floor is not gasoline vapor, it is a mixture; and as a mixture it has a very low specific gravity. It is not the specific gravity that you speak of.

Q. Now Mr. Witness if you want to leave it that way, if that is your explanation, I am going to comment on that when you are not here, and if that is your explanation, I want to give you a chance to add anything to it that you want to.

Mr. Underwood;

If your Honor please I move to strike out those remarks, on the ground that the witness should not be threatened by the great fear of comment when he is not here.

Mr. Botts:

I am just saying, if he wants to leave it that way, I am satisfied.

The Court:

Well I won't strike it.

Q. All right; now then you stated at some point in your testimony that gasoline vapor had a tendency to mix with air, did you?

A. Yes.

Q. Now then isn't it true that where two gases are materially different in specific gravity, that not only they do not have a tendency to mix, but they have a tendency to stay separate; isn't that true?

A. There is a force tending to separate them, but also forces tending to mix them.

Q. What force is tending to mix them?

A. The force of convection, and the currents,—air; certain facts that we do know.

Q. All right let's get back now for a minute to our enclosed chamber, that we had awhile ago.

Mr. Underwood:

I thought you were out of that.

Q. No.

A. I can see no application to that enclosed chamber, to the problem before us.

Q. I am sorry; I am going ahead and ask the question, because I think I will be able to draw some applications; so if you will just humor me by answering my questions. Now let's take that enclosed chamber, and we will assume that outside forces,—blowers or whatnot, have mixed the 223 cubic feet of contents of that chamber into a perfectly equalized homogeneous mixed combination vapor of gasoline and air. Now then that mixture having been ac-

complished, suppose all outside force is withdrawn, and the temperature of that mass remains exactly as it was, so that there is no outside influence whatsoever. I will ask you, wouldn't there then be a tendency for that mass to separate, and the heavier particles, of which the gasoline vapor was composed, to settle to the bottom, and the lighter fractions or parts of air, to go to the top; wouldn't that be true?

A. Yes, sir.

Q. All right; then that being true, it necessarily follows, does it not, that where there are gases, one materially heavier than the other, not only is there no tendency to confine, but there is a tendency to separate; isn't that true?

A. No, sir.

Q. All right.

A. The other question was asked in the case of the Seminole's bilge, was it not, with no restrictions as to no outside forces? You don't allow outside forces in the second premise?

Q. I am discussing now the question of whether or not—

A. You took us back to the sealed room; then you are taking us back to the engineroom.

Q. I took you back to the sealed room, and put it there, and you agreed that the gasoline vapor would settle and the air come to the top, so there would be a tendency to separate.

A. I said there would be a tendency to separation.

Q. Then the tendency, so far as it exists for gasoline vapor to combine with air, would be due to outside forces, would it not, and not to any inherent affinity or tendency inherent in the two substances, to combine?

A. It is my opinion that the outside forces are sufficient to make them mix, but I am suspicious of an inherent tendency, somewhat like that of osmose, to cause

those two liquids to definitely—those two gases to definitely mix.

Q. Well you are not wanting now to retract your answer that in the closed room there would be at least a tendency to separate? You are not—you don't mean to withdraw that?

A. No,—with no other forces.

Q. All right. Then as I understand it you would agree with the statement which I find here in this authority, refering to vapors of high density,—higher density than air, for instance, benzol, that in consequence of this high density, the individual molecules of the vapor adhere more closely and are only with difficulty mixable, or mixed, or soluble in air. Do you agree with that statement?

Mr. Underwood:

May I have the source of the statement, please?

(The question was read by the reporter.)

Mr. Botts:

I am referring to page 32 of the book which was described in evidence a short time ago.

Mr. Underwood:

Not in evidence; you mean, described in the record?

Mr. Botts:

Described in the record, I mean.

A. I would regard that as purely one man's theory, which I think is in error.

Q. Well then you disagree with this statement?

A. I am not convinced by that statement at all.

Q. Well isn't that statement largely in accord with your own opinion expressed with reference to the tendency to separate, in this enclosed room?

A. He gives—that is a statement of not only the fact, but is theory of the cause of the fact. For instance, I should like to know what the density of nitrogen is, and also what the density of oxygen is; and there are two gases which readily mix and become air; that is a mixture. And if those things have varying density, I would think it would tend to explode the theory that the knit molecules, or the closer molecules of one gas would have a tendency to prevent the intermingling with the molecules of the other gas.

Q. You disagree with the statement I have read, is that right? Or do you—are you simply quarreling with the correctness of it?

A. As an engineer, not as a chemist, where they deal with the inner structures of compounds, the statement is—I would think that would lead to a false conclusion. But I am not a chemist and I don't want to be setting myself up against that reasoning; and I don't think that the question to me is fair unless I had read the book, or knew what other facts he had developed, to lead him to make that conclusion.

Q. Well as I understand it then you are not in a position,—you don't care to deny this, nor do you care to accede to the correctness of it. Is that your position, that at this time you want to take neither position?

A. Mr. Botts, one paragraph out of a highly technical book is not anything that one should pass judgment on, unless they see more of the discussion

Q. But is there anything obscure or difficult to understand, about the statement that when two gases such as benzol and air,—and gasoline and benzol are very much of the same type,—I think you will concede that, won't you? Gasoline and benzol are very much the same,—they are both hydrocarbons aren't they?

A. Yes.

Q. All right; that there is nothing difficult about understanding the statement that gasoline vapor, being heavier

than air, would have a tendency to adhere closely together, and would not easily be mixed with air. Is there anything difficult about understanding that?

A. Very difficult for me to understand without reading more of it. For instance we often mix, in liquids, an extremely heavy thing with something that is quite light, and without effort; and I believe it is often done witn gases; and I can see no reason why affinity or attraction of a molecule within the gas vapor, and another molecule within the gas vapor, should tend to exclude the molecules of another gas, where the molecules were not so close, when we do know definitely that other, what we call fluids, which means liquids,—and gases, of definitely known differences in specific gravity, do readily mix.

Q. Well then I would like to have you put yourself in one or the other of three categories, with reference to that question: that you agree, that you disagree, or that you are not willing to commit yourself. Now in which one of those three categories will you place yourself, with reference to that question?

Mr. Underwood:

If your Honor please, I object to the question on the ground that it confronts the witness with alternatives—

The Court:

Because what?

Mr. Underwood:

Because it confronts the witness with three limited alternatives.

Mr. Botts:

Well I can ask him three questions if you want me to.

The Court:

I think that is a matter of argument, Mr. Botts.

Mr. Botts:

All right strike out the question and I will ask him:

Q. Do you, Mr. Gibbs, agree with the statement in this question with reference to the mixability of gas vapors and air?

Mr. Underwood:

If your Honor please I object to that as repetitious. He has covered the ground more than once.

Mr. Botts:

I haven't had a categorical answer, and I am trying to get him placed.

Mr. Underwood:

He has answered that question, Judge, three or four times.

The Court:

I think he has answered it, but I don't want to cut you off from your examination, if you can show me:

Mr. Botts:

He answered one time and then he started with a long discussion in which he qualified his answer; and I don't believe that he has ever given a categorical answer, that he agrees or that he does not agree.

Mr. Undrewood:

If your Honor please, he said in effect that he neither agrees nor disagrees; and if Mr. Botts doesn't understand it, that is too bad; but he has answered the question more than once.

Mr. Botts:

I am trying to get him to say he agrees, he disagrees, or he don't know; and I think that's a fair position for this highly technical witness to take.

Mr. Underwood:

He wasn't produced as a chemist, your Honor.

Mr. Botts:

Yes, but he has testified very, very fully about his knowledge of convection, which seems to explain everything; and the mixability of gases. Now he has put himself up as an expert in that, I am asking about the very thing concerning which he is attempting to testify as an expert.

The Court:

I will overrule the objection, and if it is repetition, do not repeat it again.

(By Mr. Botts):

Q. Do you agree with that statement?

A. What statement?

Q. The statement that in consequence of the relative density of gasoline vapors as compared with air, that these vapors tend to adhere together, and are not, only with difficulty, mixed and combined with air. Do you agree with that statement?

A. I agree to it in part; and welcome the authority. That part which says they do mix with air. But I do not agree that the mere fact that the molecules are closer together in one than in the other, that that is the reason why their tendency may persist in keeping them apart.

Q. All right now then, do you agree to this statement: that vapors given off by such liquids as gasoline, from the surface of liquids, tend to sink downward rather than to rise from the surface.

Mr. Underwood:

May I see that, Mr. Botts?

Mr. Botts:

I haven't used the exact words, but it is right there.

Mr. Underwood:

May it appear then, that the statement is not from the book.

Mr. Botts:

It is not in haec verba from the book.

A. Yes.

Q. You agree with that?

A. There is a tendency for them to do that.

Q. Do you agree with this statement; that where readily volatile substances yielding heavy vapors are being dealt with in any apartment, the evolved gases or vapors tend to sink by their own weight to a lower level? Do you agree with that statement?

A. Read the second word in the statement.

(The question was read by the reporter.)

A. Yes.

Q. Now then I understood you to say the other day that cowl ventilators and skylights passing through the top of the engineroom, but not passing into the bilge, together with the windows in the side of the engineroom, constituted an efficient method of exhausting any possible gasoline vapors from the bilge. Did I understand you correctly, in making that assertion?

A. The statement said, as I recall it,—was that this arrangement of ventilators was as efficient an arrangement as could be made without the use of forced draft ventilators.

Q. Well now then do you mean to say that cowl ventilators and the skylight passing through the roof or top of the engine room, coupled with the two windows, one on either side of the engineroom, and the ledges of which it appears were about five to six feet above the floor of the engineroom; do you say that those are—that that method is

or is not an efficient and sufficient method of exhausting or removing from the bilge, a possible accumulation of gasoline vapor?

A. I say that that is the most efficient arrangement that could have been used at that time, with the possible exception of a system of forced draft, which I do not even know was in existence in a practical way, at that time. And that I would regard the ventilator as being sawed off at the top, not extending down, for a distance below the roof, as more efficient than one that did extend down for a distance below the roof.

Q. Now then the question was not whether you regarded this as relatively efficient. The point I wish that you would answer is, whether or not this sort of an arrangement would be actually and practically efficient in actually removing gasoline vapor from the bilge?

Mr. Underwood:

If your Honor please, I object on two grounds; one, that it is repetitious; and the other, on the ground that it does not say how much gasoline vapor, nor does it say in how long a time.

(The last question was read by the reporter at the direction of the Court.)

The Court:

I will overrule the objection. Mr. Gibbs, if you want any other element as a basis,—element of the hypothesis, why then you can ask for it.

A. I would have to know the amount of gasoline to be removed, or gasoline vapor, or mixture, to be removed.

Q. Any amount, whether one cubic foot or one thousand cubic feet?

A. Then I would have to know the time element.

Q. One minute, or a thousand hours, take your choice; tell me about it. Now you are an expert, please don't try to evade.

A. I will not evade Mr. Botts, but I most certainly will answer the question thoroughly. It would not be, in my opinion, sufficient ventilation to remove—how many cubic feet, a thousand cubic feet, did you say?—A very large quantity of gasoline, in a time of one minute. It would be efficient—effective, to remove an amount smaller than that, in a greater period of time.

Mr. Underwood:

The last two or three words of that answer?

(The last answer was read by the reporter.)

Q. In referring to gas vapors such as gasoline vapor, in a compartment with air, would you agree with this statement, with reference to a proper way of removing the gasoline vapors: that in such case it would be fundamentally erroneous to attempt to use a ventilating appliance, working at a higher level, and the floor ventilation then becomes sine qua non. Do you agree with that statement?

A. I do not.

Q. All right. Do you understand the expression, sine qua non?

A. Well no; that—

Q. That without which, is a technical translation; but, that without which the results cannot be accomplished is the meaning of sine qua non in that connection.

A. That without which:

Mr. Underwood:

May I suggest if there is going to be any discussion about that, let's ask Mr. Botts to rephrase the question entirely in English.

Q. I read from the text, and I just wanted to be sure that the witness understood that one phrase.

A. Anybody could speak freely to me in Latin; it is all Greek to me.

Q. Do you agree then that in cases of heavy gases such as gasoline vapors, in conjunction with air—

A. Does that book say, such as gasoline vapors?

Q. It is referring to heavy gases.

A. It does not refer to them developed in continuous and gigantic quantities in factories, as by-products of manufacturing industry, and not incidental leakage of a few drops occasionally?

Q. It makes no such limitations. Now if I may just complete the question, the statement is here that, "In cases of these gases heavier than air, that floor ventilation is an absolutely necessary essential to proper ventilation". You don't agree with that statement, do you?—I have phrased that in English, eliminating the words, sine qua non. I had, in doing so, to rephrase it, to carry the idea.

A. Mr. Botts, I would like to know the quantity. Floor ventilation exists with the—

Q. Well do you concede that in cases of such heavier gases, that floor ventilation is superior to ceiling ventilation?

A. It would depend entirely on the quantity to be removed, and the speed with which it had to be removed.

Q. Well irrespective of the quantity, wouldn't floor ventilation accomplish the results quicker and more efficient, in a given length of time? Wouldn't floor ventilation accomplish the results quicker than ceiling ventilation?

A. Are you speaking of blower systems, or those ventilators we were discussing?

Q. Floor ventilation, whether blower power or otherwise.

A. Well I would have to know what was meant by the words, floor ventilation.

Q. We have got floor ventilation in the yacht Seminole; it isn't necessarily a thing called floor ventilation, which means words without a description.

A. All right, sir.

The Court:

I think it is a little difficult to extract a statement from a book and ask a question as to whether the witness agrees with the statement, when he does not know just exactly what the situation is that is being discussed. If you take it as a separate proposition, disconnect it with a text book, and ask the question, I think it might throw some light. But I don't know, just for the purpose of enlightening the Court, I don't know whether that authority is dealing there with a situation with gasoline engines present in the room or apartment, and I don't know whether he is dealing with boats, I don't know whether he is dealing with factory conditions, or just what it is.

Mr. Botts:

I can answer, so far as my examination shows, that it seems to be—

Mr. Underwood:

I object to any statement on the record as to what the book is dealing with.

The Court:

I just wanted to state the difficulty I was having, and point it out to you. I don't think you ought to put in the record, what is in the book.

(By Mr. Botts):

Q. Let's take it this way: if you had a quantity of gasoline vapors in a room, which you wished to remove without the use of power ventilation, in your judgment would that gasoline vapor be removed more efficiently by an

opening at the level of the floor, or an opening of equal size in the ceiling?

A. In the ceiling; and if there is anything that would cause maximum amount of turbulence in the room, by cross drafts, and that would be done in my opinion more efficiently by elimination of the foot to the ventilators; I mean by the foot, that part that is below the ceiling.

Q. All right; that is all right. Now would you say that, assuming gasoline vapors had collected in the bilge of the Seminole, that that vapor would be more difficult to remove from that location because it was covered with the floor of the engineroom and the deck; or would it have been more easy to remove if that flooring was absent, and it was entirely open up to the air.

A. If it was entirely covered with the floor it couldn't be removed.

Mr. Botts:

Now if you will read the question please; he didn't understand it, I don't think.

(The question was read by the reporter.)

A. If it was covered it couldn't get out. If it was partially covered, as is usual with an engineroom floor, it could get out. Whether it could get out more freely, which is very doubtful, from those two compartments, one covered by a roof and the other by a floor, with many large holes in it, is a question of the direction of the currents, as aided by baffles, such as floors. As is the air that enters the chimney of an old-fashioned lamp, which smokes, and nearly putting a diaphragm in, air rushes down into the hot chimney and then up out of the hot chimney and your flame is bright, and no carbon is formed. Such baffle construction might be an aid to circulation in the bilge and also in the engineroom.

Q. Then as I understand it your position is that the existence of this floor covering vast majority of the area above the bilge, would be in your opinion an aid to clearing the gas from the bilge?

A. There are conditions under which it would.

Q. I am speaking about the conditions of the Seminole, now. With those conditions, do you say it would or would not have been an aid?

A. I don't know where the holes are—were, in the floor, so I can't make a definite statement.

Q. Then you don't know whether there were any holes or not, do you?

A. I do know that there were definitely a number of very large holes.

Q. If you don't know where they were, how do you know that to be a fact?

A. I understand from the testimony there was still another, and I know where many of them were; I know the location of many holes in there.

Q. Do you say the existence of that floor was an aid to remove the gas from that bilge, or not?

A. What I say is that the existence of the floor, with those holes, had a certain beneficial property in the removal of those gases. I do not believe however that the gases would have been removed as readily without the floor, or without the roof in the ship. I think an open ship,—I mean no roof, no engineroom floor, that gas vapors or gas mixtures could have been more readily removed.

Q. Now it is true, isn't it, that if there were gasoline vapors in that bilge, that the level of the top of the combustible or explosive mixture would have been practically constant throughout the whole bilge, wouldn't it?

A. You are speaking of the Seminole?

Q. Yes.

A. No, not true at all.

Q. You mean with those gases, there would be one place where the gas mixture would be richer than it would in others; is that it?

A. I think that the time any gas vapor hit the—got in the bilge, that it was an air mixture, that there was continual current in that floor—below that floor, and also in the engineroom, and also within the shed of Pilkington; and I don't think there was any opportunity, unless some freak of nature had a dead calm possibly some night, with fixed temperatures; even then I question the condition that ever could occur to prevent very violent—very rapid currents of *mixture*, tending to clear the ship of gases—gasoline vapors.

Q. Now then let's come a minute to this tank. You said that in general practice, in installing tanks that you made a hydrostatic test, and if leaks developed you caulked the leaks, is that correct?

A. Depending upon the kind of tank. If it is a copper tank and the leak developed, we clear it of—we take the liquid out which we put in for the test, and we either weld it, if it is copper, any other metal that will stand the weld,—or we tin it.

Q. Suppose we take a galvanized tank such as the Seminole, how would you cure leaks in that?

A. If it is a matter of plate, we would probably caulk that, if it developed a leak, if it is a riveted tank, or thicker than a plate, we would caulk it. There are other ways to do it, however; you could put solder over the tank.

Q. Do you think soldering is a proper method of—soldering on the outside, is a proper method of stopping a leak in a tank to be used for gasoline?

A. I merely say that about—the statement of the Government men is you haven't done a job if you don't solder, completely, the edges of your tanks, whether it needs it or not; to cover all corners of sheet metal tanks with solder. Nearly all tanks are made covered with sold-

er. It may be completely wrong, but that's the way, it is considered good practice.

Q. I just asked if in your opinion that was good practice?

A. It is infinitely better practice than welding, I think.

Q. And is it better than caulking?

A. It depends entirely upon the condition, the place in the tank, and so forth.

Q. Now then let's refer back to this rubber hose for drawing off gasoline out of the engineroom. Do you approve that as proper practice on a boat, to run a hose out, connect it to a draw-off valve in the engineroom, run a rubber hose out and then disconnect it and put the hose away for future use?

A. I can't conceive of a much better way than—

Q. Don't you concede the very grave probability that in doing that, in disconnecting that hose, that a certain amount of gasoline would be spilled into the engineroom?

A. No. The man used to taking a fuel like gasoline, he knows he has got his hose filled with it; just as you go to a filling station and you see how carefully each time they do it; they have the old style hose they used to get it into the tank, just lift up and let it run through.

Q. You approve that as proper practice, do you?

A. No, I say I approve that as probably the best practice that would have answered—that would have served the Seminole in the duty that she had to perform—the best available practice. I don't think that the presence of gasoline in the vicinity of the Seminole was tended to make her safe as compared to a sailboat. I think that was the best method of serving those yachts. I think not very greatly superior to using a can of this type.

Mr. Underwood:

Indicating Exhibit 13.

Q. Then as I understand from your last answer, the drawing off of gasoline, either by hose or can, does add an

element of risk as compared—using your comparison, as comparable with a sailboat, for instance; it adds an element of risk, doesn't it?

A. Yes, the presence on the boat of gasoline at all is an element of risk, as compared to a boat without gasoline.

Q. And drawing it off in the engineroom would add a risk, as compared with not drawing it off in the engineroom—or not drawing it off at all, wouldn't it?

A. It would not add an increased risk if that duty was substituted by any other way or method of getting gasoline to the fishing fleet, from the ship.

Q. But suppose they don't take it off at all, that would be safer than to take it off even in the most careful way, wouldn't it?

A. I think so. I think if there is no gasoline needed for priming or any other thing, it would be safer.

Mr. Botts:

That is all.

Re-Direct Examination.

By Mr. Underwood:

Q. Just a few questions, Mr. Gibbs. In your experience in the construction and repair of vessels propelled by gasoline power, or tank vessels to carry gasoline, has it been necessary for you to know the flash point of gasoline?

A. Never.

Q. Does the flash point of gasoline enter into the calculations that you have had to make for the sizes of tanks, or the type of feed lines, or anything of that sort?

A. No.

Q. In your opinion is there any substantial hazard of getting gasoline vapor into the engineroom or into the bilges, by drawing it off from the drain valves, either into that can, Exhibit 13, or by means of a hose?

A. I don't think so. I would want it on my own boat.

Q. Mention has been made of your sea skiffs, and your use of copper tubing for the gasoline line. Why is it that you use copper tubing there?

A. Because there is an extremely small length of copper; the tank is built as a part of the engine, and with a tiny little length of copper, with two small fittings, there is virtually no head whatever, and no opportunity for the copper ever to be hit or twisted. Then the other reason is that the engine is gotten out on a manufacturing basis of the lowest possible cost; it is a price proposition.

Q. What is the length of the copper tube on that engine?

A. I would say offhand about six or seven inches, it may be as much as ten, I don't think so.

Q. You were asked a good many questions about the Fortuna; let me ask you a question about a boat which I think you repaired, a boat that belonged to Mr. DuPont; what was her name?

A. We have handled the work, a great many years,—the Nenemoosha.

Q. Do you know how to spell it?

A. N-e-n-e-m-o-o-s-h-a.

Q. Did you have anything to do with the installation or repair of a gasoline line in her?—Just yes or no.

A. I think we did; it was ordered done,—the work was ordered done.

Q. What type of boat was she, what power?

A. She was a large steel Diesel boat, with possibly seven or eight hundred horsepower.

Q. Did she have a supply of gasoline on board?

A. Yes, sir.

Q. Do you remember where the gasoline supply was?

A. On the deck.

Q. Was there a draw-off line?

A. Yes, sir.

Q. Where was it?

A. Down in the engineroom, under the control of the engineer.

Q. If an explosion occurred in the after part of the engineroom of the Seminole, and had upset Number One tank to some small degree, as you have observed in the photographs, would you expect any effect on the bulkhead between the engineroom and the tank compartment?

A. Explosion in the engineroom?

Q. Yes.

A. And the after part of the bulkhead?

Q. The after part of the engineroom.

A. Explosion is in the engineroom?

Q. Yes.

A. And you want to know what would be the effect—

Q. On the bulkhead between the engineroom and the tank compartment; if the explosion had any effect in deranging the position of Number One tank.

A. It would have pushed those plates away from the explosion, or in the direction of the bow of the boat.

Q. Have you examined Exhibits 3-X and 3-W?

A. Yes, sir, I have examnied them.

Q. Do those photographs show any displacement of Number One or Number Two or Number Three or Number Four gasoline tanks?

A. Not the slightest that I can detect.

Q. You have spoken about their being some holes in the engineroom floor. What holes do you know about, there, and what do you know about them?

A. The base of the engines are fastened to the scantlings of the boat, and timbers, which are not a part of the engineroom floor.

Q. Let's make it brief, Mr. Gibbs.

A. Wherever engines are installed, wherever these controls come through the engineroom floor, like clutch levers, couplings, and wherever the engineroom floor cannot be stepped upon,—as a rule that is a hole.

Q. Can you tell from your observation of what remained of the engineroom, whether there must have been holes through the engineroom floor to accomodate the two propeller shafts?

A. Yes there must have been.

Q. How about the flywheel?

A. Well, the whole engine.

Q. Engine itself?

A. Oh yes.

Q. How about the engineroom controls, those levers by which they were operated?

A. Oh yes,—slits.

Q. I think you inadvertently got your percentages and your proportions mixed in describing an explosive mixture of gasoline. Just so we will be clear about it, what is your understanding of the explosive range or mixture of gasoline vapor and air?

A. I understand that the range of gasoline vapor to air is above one and a half; not above six and a half.

Q. One further thing—

A. Percent.

Mr. Botts:

If it isn't in the record, do you know whether that refers to, by volume?

Mr. Underwood:

Just a moment, please, Mr. Botts, and then I will be through.

Q. I show you Libelants' Exhibit 12 and call your attention to a pipe which is indicated by an arrow, and ask you to assume that that was the pipe which lead from the back of the picture toward the foreground of the picture, and to the two draw-off valves. Do you see that pipe?

A. Yes.

Q. I will ask you to assume that it came from the starboard end of the manifold, a few inches to starboard of the drawoff valve from Number Four tank, and that that pipe was about six or seven feet long, from the place where it left the manifold itself and started back to port, to the place where it passed through the side of the desk. Do you visualize that situation?

A. Yes. You had the—what was your stand, can you tell me?

Q. The stand from the right-hand end of the manifold to the legs or the sides of the desk was six to seven feet; and I will ask you whether or not that in your opinion was proper support for that length of pipe?

A. What was the size?

Q. Half-inch diameter, half-inch pipe.

A. Yes that was sufficient.

Mr. Underwood:

I think that is all.

Re-Cross Examination.

By Mr. Matteson:

Q. This Nenemoosha that you spoke of is a Diesel vessel is she not?

A. Yes, sir.

Q. And she doesn't carry gasoline in her main fuel tanks, does she?

A. No, sir; she pipes it to the engineroom, from an auxiliary gasoline tank.

Q. There is an auxiliary gasoline tank?

A. She has a gasoline tank aboard for the uses that she has for gasoline; probably for the launches.

Q. Do you know whether they are used for launches, or not?

A. I know that she has launches and that they have to have gasoline.

Q. You don't know how the launches are supplied with gasoline, as a matter of fact, do you?

A. Yes I know that that pipe was designed to get gasoline for the launches; because the instructions were that all gasoline be lead to the place where the engineer alone could get it.

Q. How large a tank did they have?

A. I don't know, myself.

Q. Where is the Nenemoosha now, do you know?

A. I don't know that either. She has been in Jacksonville, last year.

Q. As a matter of fact, these various boats that you have mentioned, the only one that was designed by your firm was the Colonel, was it not?

A. Well I wouldn't say that even that boat was designed—it was largely by Colonel Greene himself.

Q. Then do you mean that all these boats that you built and have talked to us about, have been built to specifications, as you say the Fortuna was?

A. Many of them were, and many of them were built under this kind of an arrangement: that we would undertake to build a boat of such and such length, such and such speed, and with such and such other characteristics; we would be given a picture of the boat. Much of our Government work has been done on that basis, in which case we not only have to design the boat, but back up the design with as much as one thousand dollars per mile for failure to comply with the requirements of the owner, or the Government. A great many of the boats have been designed by our firm. Now in those designs we are given rather close specifications as to some of the details; the tank, for instance, must have a certain capacity. Now, the tanks must be tight, and it is up to us to make a design which will be not only satisfactory to the Government, but tight; and the speed—the lines must be of such form that the boat will make the speed. In a case of that kind I would say that we are designers, almost completely.

That is the situation with many of our boats. However, if the Government made a statement as to the tubing of the gasoline lines, we would not feel, as designers, responsible for the judgment that caused that line to be one material or another. For instance, the 75's, of which we built thirty, or approximately a million dollars worth, had brass pipes. The last boat we had, had copper tubing. Now I understand that that is to be substituted—the new specifications will come out with aluminium, brass, or bronze,—an alloy of those two; which we have already put in some portions of the last order of Government boats.

Q. Now Mr. Gibbs you have mentioned a number of yachts here to us that you have built; I have been trying to check them up here in Lloyd's Register as best I could, and the only one that I find that is designed by you, was the Colonel, and I find that she was a Diesel boat. Now am I correct in the assumption that, referring to yachts, that is the only one that you have mentioned that you have designed?

A. Well our yard does not go in much for the construction of yachts. We specialize in the construction and design of Government vessels; they are very similar to yachts; and Commercial vessels,—for oil companies: and the yacht repair business. For many years we have enjoyed the opportunity of having most of the yachts in our yard.

Mr. Matteson:

That is all.

(Witness excused.)

Mr. Underwood:

If your Honor please, I offer in evidence the paper which has previously been marked Respondents' Exhibit FF for Identification.

The Court:

Did you all get the matter of the plans straightened out?

Mr. Underwood:

We expect to have word on that this evening. Mr. Gibbs has telephoned his son to find the plans if they are there; and we expect to hear from him tonight.—I offer this letter, FF for Identification, in evidence; it is a letter which Mr. Hawkins testified that he wrote. I can't prove it was delivered to Mr. Pilkington, and I don't offer it as proof of anything that got to Mr. Pilkington. I offer it merely to prove that Mr. Hawkins wrote such a letter.

Mr. Botts:

I think that is immatterial.

Mr. Matteson:

He has testified to that.

Mr. Botts:

I don't see what it illustrates.

Mr. Underwood:

I offer it to prove that Mr. Hawkins, as an Officer of the Seminole Boat Company, was active in the business of trying to Charter the boat; he wrote that letter in pursuance of such activity. In other words, it wasn't a dormant, moribund corporation, but it was a working one.

The Court:

He has testified, hasn't he, that he did write such a letter?

Mr. Underwood:

Actually, I am not entirely clear whether he did or not.

The Court:

Well I will admit it. You can go into it a little more if you want to, and move to strike it.

Mr. Botts:

I don't think it has any materiality. I don't think it hurts whether it is in or not.

(The said paper so tendered, and previously marked Respondents' Exhibit FF for Identification, was admitted in evidence and filed as Respondents' Exhibit FF.)

Mr. Underwood:

As I read the record, your Honor, Respondents' Exhibit 5-N was merely offered by me for identification when Mr. Stein was on the stand, although my recollection is that I offered it in evidence. We all used it, so in order to complete the record, I offer it in evidence now.

The Court:

It will be admitted.

(The document previously marked Respondents' Exhibit 5-N for Identification, was admitted in evidence and filed as Respondents' Exhibit 5-N.)

Mr. Underwood:

The marking does not need to be changed, because it does not say, "For Identification", in the marking.—I have a number of corrections in the testimony of Mr. Munroe, which Mr. Matteson has agreed to, all but three. I am not sure whether Mr. Botts has had an opportunity to check them over or not.

Mr. Botts:

I haven't looked at them.

Mr. Underwood:

Well practically all of them are typographical; I don't know whether Mr. Botts will look at them and consider agreeing to them, in order to save time, or not.

Mr. Botts:

I don't want to take too much time; I won't bother with them.

Mr. Underwood:

Then may it be understood that Mr. Munroe's testimony be corrected in these particulars, with the exception of those three that Mr. Matteson questions, and about which I shall recall Mr. Munroe very briefly.

The Court:

Physically, how does that leave the record? You want somebody to be instructed to correct them?

Mr. Underwood:

I suggest that the stenographer correct the Court's copy, and make copies of this and furnish to everybody who is getting a copy of the record.

The Court:

Has Mr. Munroe gone over these?

Mr. Underwood:

Yes, sir.

The Court:

Just ask him in a general way about all except the three, and then in detail about the three.

3908 Thereupon: WIRTH MUNROE was recalled as a witness on behalf of Respondents' and further testified as follows:

Direct Examination.

By Mr. Underwood:

Q. Mr. Munroe, you have read over, have you, that list of corrections to the record, with me?

A. I have.

Q. Let's speak of all but those three opposite which there is a question mark. Have you determined that the transcript of your testimony is inaccurate in those respects and should be corrected as represented?

A. It is inaccurate.

Q. Now turning to those three that Mr. Matteson has put a question mark opposite; on page 2298 I call your attention to this question and answer: "Q. Did you find any leaks in any seams or at any rivets anywhere?" "A. There were no leaks whatsoever in any seam or any rivet in that part of that tank".—I will say that that refers to your test of one of the tanks of the Seminole; last May. Have you any correction to make about that?

A. No, I want to strike out, "In the part of that tank"—"In that part of that tank".

Q. Did you find any leaks in any part of the tank proper?

A. None whatsoever except those that were mentioned; one in the threads of the filler pipe, and the crack in the discharge.

Q. Now on page 2301 I call your attention to the question and answer reading: "Q. What do you mean by 'improper threads'?" "A. The threads having been used for some time, the threads were naturally pitted and rusted, and they wouldn't make as perfect a connection as a new fitting." Do you have any correction to make, to that?

A. Yes, I believe, I may have used the word, "used", but I meant, "exposed"; because there was no pipe or plug or anything whatsoever in the threads at the filler pipe; they had been exposed to the air and rust, ever since the fire.

Q. Now on page 2397, I call your attention to a question as follows: "Q. You were saying that it was important to have a supply of gasoline available in the engineroom for certain purposes. It would be a very simple matter to have a separate tank on deck, in the vicinity of the engineroom, for storage of gasoline that the engineer might want to draw off for any purpose, would it not?" "A. You could have a tank on deck, yes; it would be handy". Do you have any correction you want to make to that?

A. Should have had the word, "Not handy", in there; that was my full intention in the answer.

Q. In other words, would it be handy if it were on deck?

A. It would not be handy to the engineroom.

Mr. Underwood:

That is all.

The Court:

As to that, it is a mechanical matter of handling, if Mr. Botts wants to look at them; and if they are to be made, the reporter may be instructed.

Mr. Botts:

I am willing to agree to the corrections that Mr. Matteson approves.

The Court:

Is it agreeable then that the reporter be instructed to use red ink and to be guided by this notation, and to "X" out with red ink, the transcript as it is, and correct it in red ink?

Mr. Underwood:

I think that is all right, so far as the Court's copy is concerned; and I would appreciate his making one copy for Mr. Matteson.

Mr. Matteson:

I have already made the corrections in mine.

The Court:

For that purpose, let this paper be preserved in the record, and let that be known as the COURT'S EXHIBIT 1.

(Witness excused.)

(The said Exhibit being in words and figures as follows:)

Munroe—Corrections.

2443	20 from	top	Change "boat" to "day".
2445	9	bottom	Change "yes" to "no".
2448	1	top	Change to "The curved end of each pan".
2455	15	"	Change "construction" to "compartment".
2459	10	"	Change "grooved" to "curved".
"	18	"	Change "brace" to "base".
2467	18	"	Should be "bottom" of the side, not "seat".
? 2469	13 & 14	"	Strike out "in that part of that tank". ?
2470	26	"	Change "tank" to "tank's bottom".
2471	last		Strike out "not".
? 2472	12 from	top	Change "used" to exposed". ?
2474	15	"	Change "widening" to "wedging".

2481	3	"	bottom	Change "tank" to "desk".
2482	11		top	ditto
2492	16	from	top	Change "tubing" to "pipe".
2497	8		"	Change "ceiling" to "sill".
2498	7		"	Change "dead throw" to "dead front".
2503	25		"	Change "under" to "in".
2504	10		bottom	Strike out "no".
2511	5		"	Change "impliedly" to "employed".
"	4		"	Strike out "in the employ of the widow" and insert "to remove the body".
2512	6		top	Change "morals" to "mouths".
2516	5		"	Change "Biscayne Blvd" to "Main Highway".
2528	4		"	Insert "not" after "would".
2555	7		bottom	Change "wood" to "crack".
2556	3		top	Insert "not where" before the first word.
2559	9		"	Change 1 to 2 and change 2 to 3.
"	13		"	Change "newell" to "Nuta".
"	16		"	ditto
2585	11		"	Change "side" to "sight".
? 2589	5		bottom	Insert "not" after "would". ?
2741	2		top	Change "can" to "could".
"	3		"	Change "after you" to "before removing".

Mr. Underwood:

At long last, we rest, your Honor.

Mr. Matteson:

There is one thing; when Mr. Simmon was on the stand he produced and there was marked as an Exhibit, some sheets which were merely a summary of some other re-

cords, he said he took from invoices. I don't take it that is evidence of anything, except there were at some time, invoices from which he made a summary. The best evidence of course would be the invoices themselves. I made that point at the time. Since then I have sent Mr. Underwood a letter asking for the production of the original document from which this summary was compiled. As a matter of fact I don't care an awful lot whether they are produced or not, except I make the point that the original documents are the best evidence, and that I shan't accept the summary as a substitute for the best evidence.

The Court:
Was Mr. Simmon a Respondents' witness?

Mr. Matteson:
Yes, sir; Simmon was the—they called him accountant,—or the man in the office.

Mr. Underwood:
He is an accountant by profession, anyway.

Mr. Matteson:
Anyway, he had some sort of a business position in the office, and he is the man who testified that he knew about the repairs that were made in 1927, and that the tanks were removed at that time and the bottoms taken out of them and a lot of work done, in the engineroom, and what not; and in addition to that he testified that he had made up a summary from certain other records, and the summary was marked in evidence, with the understanding that it represented merely a summary of some other documents which hadn't at that time been produced.

The Court:
What is your response to that notice, Mr. Underwood?

Mr. Underwood:

If your Honor please, we have searched high and low, long before we got Mr. Mattesons', or Batchelor & Dyers' letter, and again since. I spent a good part of last Sunday looking, again; and as the record shows, half a dozen of us spent all of one evening and far into the night, at the office at 1315 Biscayne Boulevard, hunting for such things. We have not been able to locate them or identify them.

The Court:

Well in the absence of that, did I admit the summary?

Mr. Underwood:

There was no objection to that.

Mr. Matteson:

It was admitted solely as a summary of some other document.

The Court:

Are you satisfied with that search made now?

Mr. Matteson:

I take Mr. Underwood's word for it that they can't be produced; but I do make the point that the best evidence has not been produced, and I don't think what was produced is any evidence at all.

Mr. Underwood:

Our problem in the production of them, has been this: we have a lot of old vouchers, those of Merrill-Stevens are some; but these documents we are talking about, Exhibit 4-N, isn't it?

Mr. Matteson:

4-O.

Mr. Underwood:

4-N and 4-O, anything in the category, this Exhibit 4-O is a comparative statement of expenses; it deals in totals, and it does not give the name of the house from which any material was purchased, or the name of any member of the crew who worked at any particular time; it just deals in totals, by months and by years. Now it is a superhuman task, even if it could be done by a superman, to go through a batch of records now and by trial and error, add up bunches of figures on vouchers until you got the same figures that are on that statement. I don't doubt we have in the files at least some of the vouchers that were considered in making up those statements. So far as being able to produce one or a thousand vouchers, and say that numbers one to ninety-four are the ones used in support of a figure on page one at the top, and so on,—we just can't do it; it is not possible.

Mr. Matteson:

Well I didn't want the moment to pass without registering the fact that I had demanded the production of the originals, and that they haven't been or cannot be produced; and I am willing to let the record stand that way, as far as that is concerned.

The Court:

I believe the proper ruling to make would be to admit them, and if you wish—

Mr. Matteson:

I have no objection to their physically remaining in the record, because we have no jury here, and the matter is entirely for your Honor. As your Honor is aware, there isn't any such thing as reversible error in Admiralty. Both the District and Appellate Courts give to the evidence the weight it is entitled to under all the rules of evidence. I

don't see that it does any particular harm, but we may make proper comment on the evidence when it is cited.

(Thereupon the hearing was adjourned to be resumed at 9:15 o'clock A. M. of the following day, to-wit, November 17, 1939.)

Friday, November 17, 1939, 9:25 o'clock A. M.

Hearing was resumed pursuant to adjournment of the previous day.

3920 Thereupon: J. N. PATTON was recalled as a witness on behalf of Libelants, in rebuttal, and further testified as follows:

Direct Examination.

By Mr. Matteson:

Q. Captain Patton, after the adjournment of Court in May, May 19th, when did you next see the Seminole?

A. I believe it was five or six days afterward.

Q. How did that come about?

A. I had business up at Nuta's Yard, on another boat; I happened to remark to Mr. Nuta, "How is the Seminole?" He says, Oh there was trouble—

Mr. Underwood:

I object to what Mr. Nuta said.

Q. Don't tell what anybody else said; but you were out there on other business?

A. Yes, sir.

Q. Did you see the Seminole on that occasion?

A. Yes, sir.

Q. And what did you observe?

A. I observed that one of the tanks was taken out of her.
Q. And where was the tank when you saw it?
A. Laying in the corridor of the tank compartment.
Q. What did you do?
A. Went up the following day and took some pictures of it.
Q. Well did you go on board the Seminole?
A. Not at that time I didn't. The following day, I did.
Q. The following day. Did you observe the condition of the tank at that time?
A. Yes, sir.
Q. What did you observe?
A. I observed that on the side seam it had been soldered at some time; and also, on the bottom seam there was portions of that, that still solder remained.
Q. How much of the side seam had been soldered?
A. I didn't measure it, but I imagine about 20 inches.
Q. And you say that you took some pictures of it at that time?
A. Yes, sir.
Q. Let me ask you this: did you observe whether there was any evidence of solder on the rivets at that time?
A. No, sir, there was none.
Q. You say there was none?
A. No, sir.
Q. And was there any solder,—any evidence of solder, on the side seam above the 20 inches that you speak of?
A. No, sir, none that I could see.
Q. Did you examine the tank for the purpose of determining where the solder was?
A. Yes, sir.
Q. Was there any evidence of welding on the tank?
A. No, sir.
Q. Are you familiar with both welding and soldering?
A. Yes, sir, and brazing.

Q. Is there any difference in appearance between soldering and welding?

A. Yes, a great deal of difference.

Q. What is the difference?

A. Well in welding, either electric welding or torch, a man has to feed his stick of welding material; it makes little lumps like little waves, as he advances the steel into the flame of the torch, it makes little lumps; I don't know as I can describe it. And in soldering, the soldering material, it can be soldered properly, you can make a smooth —you can draw your solder right along the seam, also run the solder in the seam, providing you can get the material that is soldered hot enough so that it will run.

Q. Is there any difference in color between soldering and welding?

A. Yes, sir.

Q. What is that difference?

A. Well your solder would look like the tarnished silver, in time. The welding would look rusty, unless it was painted.

Q. Well I am talking about fresh work, Captain.

A. The silver,—the lead solder would have a silvery appearance, shiny. The welding would be the same as raw iron.

Q. And would there by any—outside of the color, would there be any difference in the texture of the surface?

A. Yes, the welding would be a little wavy, where the solder would be smooth.

Q. In your opinion, could anyone with any familiarity with welding, be mistaken as to whether work was welding or soldering?

Mr. Underwood:

I object to that. He is asking this witness whether some other witness could be mistaken.

Mr. Matteson:

If your Honor please, there was one witness who testified in this case, Mr. Simmon, and he testified at great length after his observations.

The Court:

Do you want this argument in the record?

Mr. Matteson:

Well I don't care whether it is in the record or not. I think your Honor should have it in mind, because this trial has been so disjointed we may lose track of things. But this witness Simmon testified in great detail that he was there when these repairs were done in 1927; that the tanks were taken out of the ship at that time, the bottoms were taken out of the tanks; that the bottoms were replaced and welded in place; that he personally had had experience with welding and knew what welding looked like. And the question of the veracity of that witness, or the credibility of that witness, is exceedingly important in this case. Now when the tank has been examined it appears very clearly that there was no welding on the tank. I think that will be conceded by our opponents. There was some soldering. What I am doing is bringing out further a witness who is familiar with both classes of work; that there is such a difference between the appearance of the two classes of work that anyone that has any familiarity with those types of work at all, would not be mistaken about a point like that. I think that is very important; that is the reason I asked this witness.

Mr. Underwood:

If your Honor please, I don't object to what Mr. Matteson says he is doing, but I object to his question; because it asks of this witness in effect to tell whether another witness could be mistaken. I don't object to his bringing out any difference which he says exists in welding and

soldering; but I object to his asking this witness whether another person could be mistaken when he looked at it.

Mr. Matteson:
Will you read the question as it is framed?

(The question objected to was read by the reporter.)

The Court:
I think the question is all right. I overrule the objection.

A. A professional welder or tinsmith certainly could not be mistaken.

Q. Well I am not talking about a professional, Captain; I am talking about anyone that has ordinary familiarity with that type of work.

Mr. Underwood:
I object to that now, on the ground that it is leading. He got an answer he didn't like, and now he is trying to cure it.

Mr. Anderson:
He asks for an opinion, that the Court is just as able to form as the witness. The basis of opinion evidence is upon matters that the Court does not know.

The Court:
Of course one way you look at it, it is for the Court to determine from the facts proven, as to what an ordinary person could or could not have seen; but I construe the question as just another way of asking him that, and helping the Court to draw that conclusion. So I think it is not objectionable; I overrule the objection.

A. May I make that answer clearer?

(By Mr. Matteson):
Yes.

A. What I wish to convey is that some farmer that never saw a plate welded, might not be able to distinguish; but anyone around a shipyard or boiler works or iron works would certainly know the difference between welding and soldering.

Q. Now were there any evidences of red paint on the tank, when you saw it—

A. No, sir.

Q. —in May. From your observation of the tank at that time are you able to form an opinion as to whether there had ever been any solder on the side seam of the tank above the 20 inch space where the solder was apparent?

A. My opinion it never had been; no, sir.

Q. Why do you form that opinion?

A. Well had that been soldered above that space, and even under intense heat, enough to burn it off, it would still show the discoloration of the solder where it had been attached to the galvanized iron.

Q. From your observation of the tank are you able to form an opinion as to whether or not it was galvanized after being put together, or simply made of galvanized plates?

Mr. Underwood:
I am sorry; may I have the question read, please?

(The question was read by the reporter.)

A. I am of the opinion those tanks were made of rolled galvanized plates, then put together.

Q. Why do you say that?

A. Well if they were dipped, it would show signs in the seams and around the rivet heads.

Q. And were there any such signs?

A. No, sir, not that I could observe.

Q. Now from your observation of the bottom of that tank, are you able to form an opinion as to whether or not the bottom of the tank had ever been removed and replaced?

A. Not that I could find; no evidence to prove it to me.

Q. Well if it had been removed and replaced, is there anything that you would expect to observe?

A. Yes, they would have to remove the rivets with a chisel; they would have to cut the heads of the rivets off with a chisel, to back them out; and if that was done, there would certainly be some marks on some of the rivets that would show the chisel marks.

Q. Were there any such marks on the tank?

A. No, sir.

Q. Now did you say that you took some pictures when you were there in May?

A. Yes, sir.

Q. What is this picture that I show you?

A. That of the tank, looking from the bottom of the tank, forward. That's the tank that has been removed.

Q. That's the one that was lying on deck?

A. Yes, sir.

Q. What kind of film did you use to take these pictures?

A. Just this 35c film, in a box camera.

Q. You don't know the kind of film?

A. No, sir, I don't; I could find out where I buy it. Is there a film called Verichrome?

Q. You mean Verichrome?

A. Verichrome, I think that's it.

The Court:

When did you take these, now?

E-11

(By Mr. Matteson):

Q. Will you tell me just exactly when you took that picture?

A. May 26th; I marked the date.

The Court:

1939?

A. Yes, sir; that was within a week after we all went out.

(By Mr. Matteson):

Q. And on the back of this picture I notice you have written a description; it says, "Close-up of the bottom of Number four tank of the Yacht Seminole, showing side seam of tank, where seam had been soldered approximately 20 inches from the bottom". Is that a correct description of the picture?

A. Yes, sir.

Mr. Matteson:

I would like to have that marked as 139.

By Mr. Underwood:

Q. This black mark at the side of the tank, is a shadow, I take it?

A. I shadow of the bent frame, I believe.

Q. At any rate, that is a shadow?

A. Yes, sir.

Q. And you can't see the bottom of the tank at all?

A. No, sir.

Q. Just all black, is that right?

A. Yes, sir.

Q. You said a moment ago that this was taken a few days after we were all out there. You don't mean that did you?

A. I do.

Q. After who all was out there?

A. Judge Holland was there.

Q. This was taken after that, was it?

A. Yes. The tank was removed—no, wait a minute. No, I am wrong; I am twisted.

Q. Your memory is faulty on that? It is faulty on that?

A. Yes, on that.

Mr. Underwood:

I have no objection to the picture.

A. It was a few days after Judge Holland set a date for us, when Court adjourned.

(By Mr. Matteson):

Q. And is the date on the back of this picture, the date on which the picture was taken?

A. That is the date on which the picture was taken.

(The photograph so tendered, was admitted in evidence and filed as Libelants' Exhibit 139.)

Q. I show you a second picture; what is that?

A. That is standing on Number One tank, looking across the coal bunker or the tank compartment.

Q. And when was that taken?

A. The same date.

Mr. Matteson:

I now offer that in evidence.

Mr. Underwood:

Have you extra copies of these?

Mr. Matteson:

I will have some made.

(The photograph so tendered was admitted in evidence and filed as Libelants' Exhibit 140.)

(By Mr. Matteson):

Q. Now what is this that I show you, Captain?

A. This is standing in the alleyway, that is the passageway, looking forward to this tank.

Q. And what is the wall that appears at the left-hand side of the picture?

A. That is the steel bulkhead of the engine room.

Q. Is that the passageway wall?

A. This is the passageway; these are the frames.

Mr. Underwood:

Let's mark that, steel bulkhead of engine room.

The Court:

Separating what, Captain?

A. Separating the passageway from the engine room; the other side of the steel bulkhead is the engine room. This part is the starboard side of the coal bunker.

Q. Then I understand it, when you took this picture you were standing in the passageway that goes on the starboard side of the engine room?

A. Yes, sir.

Q. Looking forward?

A. Yes, sir.

The Court:

And that tank with the shadow on it, is the Number One tank?

A. Number Four.

The Court:

Number Four, yes.

Mr. Matteson:

I offer that.

Mr. Underwood:

I would like to ask one or two questions:

By Mr. Underwood:

Q. Now Captain Patton, in this photograph that is offered in evidence now, you said that this bulkhead at the left is the engineroom bulkhead; is that right?

A. No that part—that is the same bulkhead that goes along, forming the coal bunker, too.

Q. How many plates show in that bulkhead in that photograph? Two, isn't it?

A. Two; there is your angle iron.

Q. Now let's look at this Exhibit 140 for a minute; how many plates show in that same bulkhead there?

A. Two.

Q. For as a matter of fact, Captain, the tank compartment bulkhead, where it is adjacent to the alleyway, is made up of two plates isn't it?

A. That's right.

Q. And in this photograph that is offered in evidence, only those two plates show, and not all of them; isn't that so?

A. That is right.

Q. So that is not the engineroom bulkhead is it?

A. It is a continuation.

Q. But it isn't the engineroom bulkhead is it? It is the tank compartment, isn't it? Isn't that right?

A. No.

Q. Please answer the question.

A. Wait a minute.

Q. Well please answer the question; is it or is it not only the tank compartment bulkhead?

A. Yes, which is a continuation of the engineroom bulkhead.

Mr. Underwood:
I have no objection to the photograph.

(The said photograph so tendered was admitted in evidence and filed as Libelants' Exhibit 141.)

(By Mr. Matteson):
Q. And what is this next picture that I show you, Captain?
A. Looking down between tanks and Number One and Two, at tank compartment bulkhead, showing remains of 2 x 4 battens used to secure tank.
Q. Taken at the same time and place?
A. Yes, sir.

Mr. Matteson:
I would like to have that marked.

Mr. Underwood:
I have no objection.

(The said photograph so tendered was admitted in evidence and filed as Libelants' Exhibit 142.)

Q. I show you another picture, Captain, and ask you what that is?
A. That is looking down in the space where Number Four tank was taken out.
Q. Was that taken at the same time and place?
A. Yes, sir.

Mr. Matteson:
I offer that; any objection to this?

Mr. Underwood:
No.

(The said photograph so tendered was admitted in evidence and filed as Libelants' Exhibit 143.)

Q. I show you another picture, Captain, and ask you what that is?

A. Standing on Number Two tank looking across the top of the tanks, or where this Number Four was. Number Four you can just see it down there.

Q. That is looking toward the starboard side of the ship?

A. Yes, sir.

Q. The left-hand picture is toward the bow of the ship?

A. That is right.

Mr. Matteson:

I offer that; any objection to that?

Mr. Underwood:

I have no objection to that.

(The said photograph so tendered was admitted in evidence and filed as Libelants' Exhibit 144.)

Q. I show you another photograph, Captain, and ask you what that is?

A. That was standing on the float, taken from the float, looking at the starboard side of the boat. Here is the tank.

Q. As you have drawn an arrow, to Number Four tank, it shows the tank that had been removed; is that right?

A. Yes, sir.

Mr. Matteson:

I offer that.

Mr. Underwood:

Of course as to all these, your Honor, I object to the description on the back as having no binding effect on me.

I don't mind the witness telling what it is, saying what he did. But I don't think—I take it that in none of these has the description on the back been offered—just the photograph itself?

Mr. Matteson:

I think the description the witness has given has been practically the same.

Mr. Underwood:

Well I don't mind your having the witness describe it; I have no objection to that.

(The said photograph so tendered was admitted in evidence and filed as Libelants' Exhibit 145.)

Q. I have one more, Captain; what is that?

A. That picture is of the starboard side of the Seminole, showing the tank and tank compartment, taken from the dock,—or from the dry dock.

Mr. Underwood:

I have no objection to that.

(The said photograph so tendered was admitted in evidence and filed as Libelants' Exhibit 146.)

Q. This last picture, 146, Captain Patton, there seems to be a pile of pipe in the background of the picture; what was that?

A. Oh that is dredging pipe.

Q. Was that on the Seminole?

A. No, no; dredging out the river; stored it on the bank.

Q. That has nothing to do with the Seminole?

A. Oh no.

Q. All these pictures were taken at the same time and place?

A. Yes, sir.

Q. Now did you accompany the Court and Counsel on a visit to the Seminole in October of this year?

A. Yes, sir.

Q. And did you observe the conditions of the tank,—Number Four tank which had been removed—at that time?

A. Yes, sir.

Q. Was there any difference in the appearance of the tank in October, than when you saw it in May?

A. None that I could see.

Q. What have you observed with respect to the side plating of the Seminole, Captain?

A. You mean, the condition of it?

Q. Not the condition; what is there on the ship in the way of side plating?

A. Well she was a single-plated vessel one time, but they replated over the other plate.

Q. Had new plates put on over the old plates?

A. Over the original plates; yes, sir.

Q. Was that true on both sides of the vessel?

A. To be perfectly honest, I didn't look at the starboard side, but I did on the port.

Q. You did observe then on the port side?

A. Yes, sir.

Q. And is that true to the extent of the part of the ship which contains the engineroom and the tank compartment?

A. Yes, sir.

Q. What did you observe of the tanks with respect to whether it had been caulked or not?

A. I am of the opinion those tanks had not been caulked.

Q. Why are you of that opinion?

A. Well if the seam had been caulked, it would show the indentation of the caulking iron on the edges.

Q. And did you look and see whether there was such evidence of caulking?

A. Yes, sir, I did; the sides and top and bottom.

Q. Was there any such evidence?

A. No, sir.

Q. Captain I think you testified that you went out to the Pilkington Yard on the day of the fire?

A. Yes, sir.

Q. Just to refresh our recollection will you tell us what time you got there, about?

A. It was just coming on dark, around seven o'clock.

Q. You were there while the fire was burning?

A. Yes, sir.

Q. And how long were you there at the yard, off and on, during that period of the fire?

A. I was there practically all the time until we got Captain Abel's body out; that is two days later.

Q. And were you on the Seminole at that time, during that period?

A. The day they took the body out I was, yes. You couldn't get on her while it was burning.

Q. Were you on the Seminole while they were working preliminary to that?

A. Yes, sir. I run the air pump for the diver.

Q. Now Captain there has been some suggestion here that the Seminole, before the fire, had in her engine room on each side, four two-inch pipes running from the deck just outside of the trunk, from the engineroom down through into the lower part of the bilge. The pipes on the starboard side are said to have run just outside of the engineroom and fireroom bulkhead in the passageway; and the ones on the port side, down from the deck into the bilge space. Did you see any such pipes there at the time of the fire?

A. No, sir, I didn't. You mean after the fire?

Q. Well at any time while you were there at about the time of the fire.

A. No, sir, I did not.

Q. Captain, referring to Exhibit 11, and the joining of Crane valve Number 150, with the part of the union which is adjacent to it, there has been a suggestion that that might have been tight if it were screwed up so that the face of the union came in contact with the valve. What can you say of that joinder of the union with the valve, as to whether it would be satisfactory, in your opinion, for a gas tightness, or not?

A. No, sir, it wouldn't.

Q. Why not?

A. Well the valve and the union does not tighten up on the close nipple, not on the threads. To get that tight you would have to screw that up so tight in making a joint out of this end of the union and this end of the valve; a pipefitter wouldn't pass that job.

Mr. Underwood:

I move to strike that out,—what a pipefitter would do.

A. Well I have done some pipe fitting.

Mr. Underwood:

Wait a minute, let the Court rule, please.

The Court:

I think that is proper; I mean, I think this motion is well taken, to strike.

(By Mr. Matteson):

Q. Well assuming, Captain, that it could be screwed up so that there would be at least a temporary fit between the union and the valve, what would you say about it?

A. Well a very slight jar would be very apt to loosen it.

Q. In your opinion, would that be a satisfactory connection for gasoline?

A. No, sir.

Q. Captain, I think that you have testified that you saw this set of valves at the time of the fire, or shortly after. Now of course there are some marks that have been put on that by the tools which I think you and Mr. Munroe used to break one or more of the joints. Outside of that—

A. No, all we did was take the bonnets off.

Q. You didn't break any joints?

A. No, sir.

Q. There are some tool marks here—

A. On the bonnet of the valves.

Q. On the bonnet of the valves, where you took the bonnet off?

A. Yes, sir.

Q. Outside of those marks, is the exhibit in the same condition as when you first saw it?

A. Yes, sir, except that they are loose; that is, these other connections are loose.

Q. Except that the joints have been broken?

A. Yes, sir.

Mr. Underwood:

I move to strike that out as leading.

Mr. Matteson:

I thought I was summarizing what he said.

Mr. Underwood:

A distinct departure from what he said.

Mr. Matteson:

Okay, I will withdraw it.

(By Mr. Matteson):

Q. Will you just tell us, Captain Patton, any respects in which these are different from the condition in which you first saw them?

A. All the parts are here, except for being scarred up with a Stilson wrench, and the joints broken,—in the same condition.

Q. What do you mean by the joints broken?

A. Well all these connections are loose.

Q. Well I mean, we may not understand the term, "broken", Captain?

A. Well they were all rigid when I first saw them.

Q. What is that?

A. They were all rigid; none of these joints were loose when I first saw them.

Q. Captain, there has been some testimony here about the necessity of priming engines such as the Seminole had. Are you familiar with the operation of such engines?

A. Yes, sir.

Q. In your opinion, how much gasoline would be required to prime those engines when they were cold?

A. Well I should say, two squirts with a squirt gun, in each petcock, would be ample. If you got too much in they wouldn't start at all.

Q. How much would two squirts of a squirt gun amount to?

A. Possibly a teaspoonful; less than that, I should say.

Q. Can you give us an opinion as to whether engines of that type would require priming if they were hot?

A. No, sir, not if they were hot, if the engines were in fairly good working order.

Q. Well there may be some confusion between my question and your answer. Do I understand that you say they would or would not require priming when they were hot?

A. Not when hot, no, sir.

Q. Captain, in your testimony given last spring, I think that you testified that in your opinion it was not proper to have draw-off valves for gasoline in the engineroom. Now it has been suggested that the engines of the Seminole required priming when they started,—when they

were started, either hot or cold. If that were the fact, would you consider that in your opinion it was proper to have draw-off valves for gasoline in the engineroom?

A. In my opinion it is a great hazard to have a draw-off valve in an engineroom for any purpose whatsoever.

Q. And in your opinion is it proper to have such valves in an engineroom, even if the engines require priming, both hot and cold?

A. You mean, draw-off valves in the engineroom?

Q. Yes, sir.

A. No, sir, I don't approve it.

Q. Now if gasoline were required in the engineroom for priming or any other purpose, is there any method by which a supply of gasoline could be kept safely in the engineroom for such purpose?

A. In a screw top approved can, yes.

Q. And have you in mind a type of can which you think would be proper and safe?

A. Yes, sir; that red can is approved.

Q. You refer to Exhibit 137?

A. Yes, sir. There are various types, but they are all screw top filler, and screw discharge,—screw caps on them.

Q. Do I understand that there are other types that you would also consider satisfactory?

A. Yes, sir, providing they have screw caps.

Q. There has been some suggestion of a can of this type, to be used directly for priming the engines. In your opinion, would the can be suitable for that purpose?

A. No, sir. That can is suitable to fill your squirt can.

Q. You wouldn't attempt to prime engines with it?

A. No, sir; you could hot regulate your gasoline that you needed in each priming,—anything like that.

Q. It has been suggested that such type of can would be unsatisfactory because it might wear out. What is your opinion as to that?

A. I don't see where it would wear out. You have got that chafing piece on the bottom, and if it did wear out, after a great number of years, it started to leak, that can would be kept in an engineroom on the workbench, and if it developed a leak it would show signs of gasoline on the workbench, and would call the man's attention to the fact it was leaking. I have known of cans like that to be in service for eight or ten years.

Q. Are such cans expensive, Captain?

A. That one cost $3.50.

Q. It has been suggested, Captain, that the fact that this can was fitted with a flexible metal outlet for pouring gasoline through, would be unsatisfactory; the flexible metal outlet might leak or might wear so that it leaked?

A. Then you could remove that plug.

Mr. Underwood:

Will you read the answer?

(The answer was read by the reporter.)

A. Remove this plug and put another piece of flexible tubing in it. Another thing, if it did leak, it would only leak at the time you were filling your squirt can.

Q. Is this piece of flexible hose any essential part of the can for this purpose?

A. It is only to convey your gasoline from your tank to your squirt can when it is in that position. When it is in that position your plug valve is closed.

Q. Do all of the types of cans that you refer to, that are on the market, which might be used for this purpose, have flexible hoses attached to them?

A. No, some that have spouts on them; but the majority of them have the flexible hose.

Q. In your experience, have you found any objection to the use of a flexible hose in that type of can?

A. No, sir.

Q. Captain, it has been suggested here that the fact that at times it was customary for the Seminole to supply gasoline from her tanks to other fishing vessels, or other vessels which might be accompanying her; would that in your opinion make it proper to have a draw-off valve for gasoline in the engineroom?

A. No, sir.

Q. Why not?

A. You have that danger of gasoline; the hoses might leak, might burst,—though there is very little pressure on it; you have still got your draw-off valve in the engineroom.

Q. What is your objection to that?

A. A bad fire hazard. I don't believe in loose gasoline below decks in any engineroom or in any hull.

Q. Now is there any other method by which—which could be used for supplying gasoline from the tank of a vessel like the Seminole, to other vessels, which would not involve handling it below deck?

A. Yes, sir; you could hook up a transfer pump from your fuel line, your manifold, leading it up and discharging on deck through a hose.

Q. In that event would there be any loose gasoline handled in the engineroom?

A. No, sir.

Q. Where would you put your pump?

A. Pump could be mounted on your engineroom bulkhead.

Q. Now Captain you gave some testimony before, with respect to ventilation. Now with respect to the tank compartment, first, it has been suggested that the four holes at the top of the bulkhead between the engineroom and the tank compartment, through which the filler lines passed, four holes in that compartment, in that bulkhead, at a lower level where the feed lines came out from the gasoline tanks, and the square opening at

the bottom of the bulkhead, which lead from the engine-room floor to the space under the tanks, would constitute adequate ventilation for the space forward of the engineroom in which the tanks were located; what is your opinion as to that?

A. It is insufficient ventilation.

Q. What is that?

A. Very insufficient. It isn't what I would call thorough ventilation.

Q. Now Captain, it has also been suggested that as far as ventilating the engineroom—the space under the tanks, that that ventilation in the upper part of the engine-room, consisting of windows, cowl ventilators, hatch and skylight, would be adequate, because it is said that there is a force known as convection, which causes the gases which might accumulate in the lower part of the vessel, either under the floors, or just above the floors, to rise, due to variations in temperature, so that they would be carried out by the ventilation in the upper part of the engineroom. In your experience, can you tell us whether such an action occurs on vessels, which would make the ventilation in the upper part of the engineroom, adequate?

A. Ventilating the upper part of the engineroom, cross draft through the windows, might have some small effect on the bilges. It is my opinion that to get the gas out of the pockets in the bilges, you want a through draft; a ventilator going to the bilge, and an exit or exhaust ventilator to take it out. You have got to stir up those heavy gases in the bilge to get them out of there.

Q. And stir them up, how?

A. With air, a current of air passing.

Q. And in your opinion, is there any other way of securing adequate motion of air in the bilges, other than by installing ventilators such as you have suggested, leading to the bilges?

Moore

A. Install exhaust blowers. But in my opinion, the natural cowl ventilators ventilation twenty-four hours a day, goes on without switching any blowers, and all that thing,—that's my opinion.

Q. Well the point I was asking you about is, in the absence of some induced circulation through ventilator, either natural or forced, in your opinion would those gases in the bilges be dissipated and carried off?

A. No, sir, I think they would stay there. All bilges have pockets; this heavy gas gets in there and you have got to stir them up to get them out of there. Variations in temperature may lift some of it, but very little.

Q. Did you observe the bracing of the tanks in the tank compartment?

A. There wasn't much left of the wood braces. There had been 4 x 4's in there on the forward and after side, none that I could see on the sides.

Q. Without the bracing to the sides, would you consider that the other bracing—I mean, between the Number One tank and the port bulkhead, and between Number Four tank and the starboard bulkhead—would bracing be adequate to hold those tanks steady, in your opinion?

A. You mean, on the sides of the tank?

Q. Yes.

A. I just didn't catch that.

Q. I mean, assuming that there were saddles or braces, —separators, between Number One and Number Two tank, Number Two and Three, Number Three and Four, but that there were no braces between Number Four and the starboard bulkhead, or between Number One and the port bulkhead; do you think that such bracing would be adequate to hold the tanks steady?

A. No, sir.

Mr. Underwood:

I object to that on the ground there is no evidence in the case that there were no such braces.